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New Series, Vol. LIII

# The Auk

## A Quarterly Journal of Ornithology

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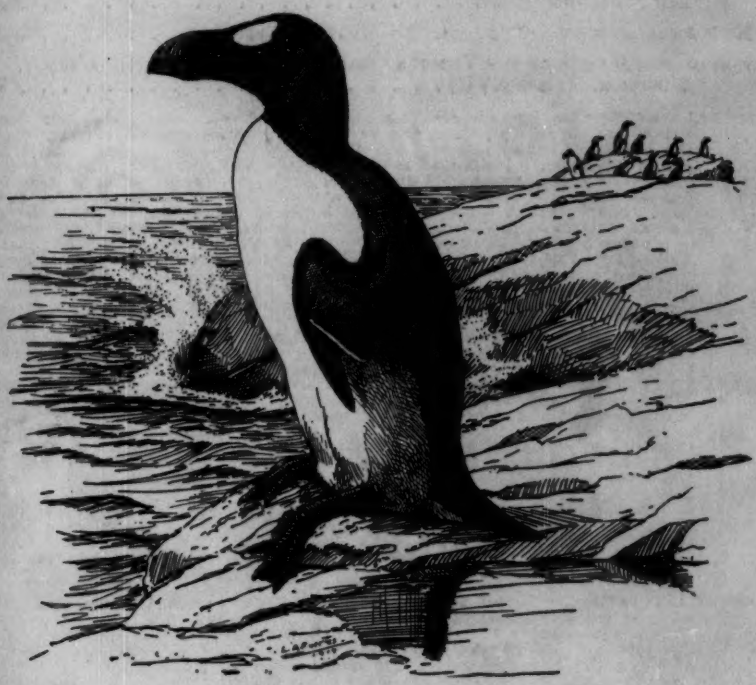

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OSPREYS (PANDION HALIAETUS CAROLINENSIS) FLYING OVER THEIR NEST IN A DEAD PINE TREE.

UNIV. OF MICH.

# THE AUK:

## A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. LIII. JULY, 1936. No. 3.

## THE OSPREYS OF SMITH'S POINT, VIRGINIA.

BY W. BRYANT TYRRELL.

*Plates XI–XIV.*

ON APRIL 28 and 29, 1934, R. Bruce Overington and the writer spent a very delightful day-and-a-half in a cabin of Mr. Overington's, at Smith's Point, Virginia. The object of the trip was to secure some photographs of Ospreys. About forty nests of the birds were located on that short visit. This prompted the suggestion to the Biological Survey that there was a possibility of banding a considerable number of nestling Ospreys, in a comparatively small area. The suggestion was favorably considered by Dr. W. B. Bell and Mr. F. C. Lincoln. So, on June 15, 1934, accompanied by Mr. Edward McColgan and my twelve-year-old son Arthur, I proceeded to Smith's Point for a ten days stay.

Smith's Point is a point of land extending into Chesapeake Bay on the south, or Virginia, side of the Potomac River. The Little Wicomico River, with its many coves, enters into the Bay also at Smith's Point, while the Great Wicomico with its numerous creeks enters about six miles farther south. A glance at the U. S. Topographical map will show the extent to which the country is cut into by these many waterways. Anyone at all familiar with Ospreys will realize the possibilities for finding their nests in such a region. The country round about is used for general farming, although along most of the creeks and water courses there is considerable woodland, composed chiefly of evergreens.

The areas over which we worked with their seventy-six nests will be considered separately.

The first and most important we shall call, for convenience, the Smith's Point Area. The mouth of the Little Wicomico River was formerly about three-quarters of a mile to the north and west of the present mouth, which is now at the Point. The original mouth was closed some years ago by a storm, after which the present mouth opened and has since been deepened

by dredging. There, on a wooded knoll, is Mr. Overington's cabin in which we lived. The trees here are all evergreens, pitch pine (*Pinus rigida*) with a few red cedars (*Juniperus virginiana*), twenty to twenty-five feet high, in places so thickly tangled with poison ivy (*Rhus toxicodendron*), trumpet flower vines (*Tecoma radicans*), and green brier (*Smilax rotundifolia*) that it is difficult to get through to the wide, sandy beach beyond. The knoll slopes away to the south and there the trees are larger. One, about three hundred yards from camp, has an Osprey nest forty-two feet from the ground. For about three-quarters of a mile from there, pitch pines give way to scrub pine (*Pinus virginiana*) which in places are not ten feet high. Beyond, to the south and west, the pitch pines predominate. Here also is found Adam's needle (*Yucca filamentosa*) and the prickly pear (*Opuntia vulgaris*). Farther back are a few low growing blueberries (*Vaccinium virgatum*) with an abundance of poison ivy and green brier. The ground near the beach and among the scrub pines is mostly of clean sand, although under the low hanging branches of the pines there is usually a bed of needles. In this region, no less than twenty-seven nests were located, twenty-five of which were occupied.

Across the channel the growth is similar to that about the cabin—a dense growth of almost impenetrable pines, the jagged dead branches of which played havoc with our clothes. At the edge of this tangle, about the coves, are several nests. Farther up the river and along the wooded banks of all the coves and creeks visited we found more nests. In this area most of our work was done, and here fifty-six nests were located.

The Owen's Pond area was visited one afternoon at the invitation of the owner, who piloted us around. There the pines which surrounded the pond reached an estimated height of sixty or seventy feet and Osprey nests were in the tops of several. We located twelve nests in all and looked over less than half of the area.

The third region visited, but not the least interesting, was Ingram Bay at the mouth of the Great Wicomico River. There we went with a motor boat to nine Duck blinds at varying distances from the shore. On the top of four were occupied Osprey nests; on a fifth was a Green Heron's nest; and on a sixth was a nest, probably a Crow's. While going to these various blinds we saw several nests on the shore, but only visited two of these. This description, I hope, will help to visualize the region.

On the afternoon of June 15, 1934, we arrived at Reedville—the nearest town of any size to Smith's Point—too late to do any work. On the morning of the 16th, in the first three nests visited we found young too small to band, and then after establishing ourselves in camp we visited eleven more nests, in none of which were birds found big enough to band, while in some of the nests there still were eggs. It was not until the 19th of June, after

visiting twenty-seven nests, that we found birds large enough to band. The first nest contained four young, three of which were banded. This, by the way, was the only nest in which four young were found. Five more birds were banded that afternoon. From then on birds were banded each day, until on the last day, the 24th of June, sixteen birds were banded when we revisited a number of nests. In all, fifty-seven nestling Osprey and three nestling Great Blue Herons were banded. This represented but a small percentage of the actual number of young birds in the region. With more time, and better facilities for getting over the water—we had only a skiff—I believe one could band two or three times as many birds.

Of the seventy-six nests found, one was located on the roots of a tree, which had been washed up on the beach; four were on top of Duck blinds in the Great Wicomico River and all the others were in trees, varying from nine feet six inches high to an estimated height of sixty or seventy feet. The highest one climbed and measured was nest No. 45, which was 44 feet from the ground.

The nests of the Osprey are bulky structures, which are added to each year and used year after year, usually by the same pair of birds. They are composed mostly of rough sticks, though all manner of other materials are picked up and brought to the nest. Pieces of nets and rope were very common, clods of earth, sand-coated eel grass, corn stalks, small boards, parts of crabs, and almost any object that could be found along the beach. One of the most unusual things which was found was an old blackberry stalk, thick with thorns, about six feet long.

The nest is usually lined with eel grass, which in hot weather is frequently renewed to help keep the nestlings cool. Several times I watched adults either pick up eel grass out of the water and carry it dripping to the nest, or take bunches which had been washed up on the beach. One nest was bedded with fresh-cut clover hay from a nearby field.

The young show a considerable variation in color at about the same age, but the pattern is uniform. Birds a few days old are covered with a thin, light-colored down, with the pulpy feather sheaths showing as darker patches. This gives the appearance of a light streak from the head to the tail. There is a black patch around the eye extending to the bill. The cree and feet are pinkish. The navel is conspicuous as a comparatively large, naked, circular patch. As the bird develops, the general appearance is dark bluish, the feathers of the head developing first, with the other feathers showing as tufts of light-colored down. The navel is obscured by the growing feathers, the cree darkens, and the feet begin to have the characteristic color of the adult. The birds develop quite rapidly, being large enough to band at about ten days. During our stay we found birds from newly hatched and still wet, to those which we believed to be about half grown.

The action of the young in the nest is for the most part to feign death, although at times they did rise and with mouths wide open begged for food. But generally, even when handled, they lie limp, and we were usually unable to get them to "perk up." Some of this inactivity may have been due to the intense heat, which made the birds pant heavily, even when lying still.

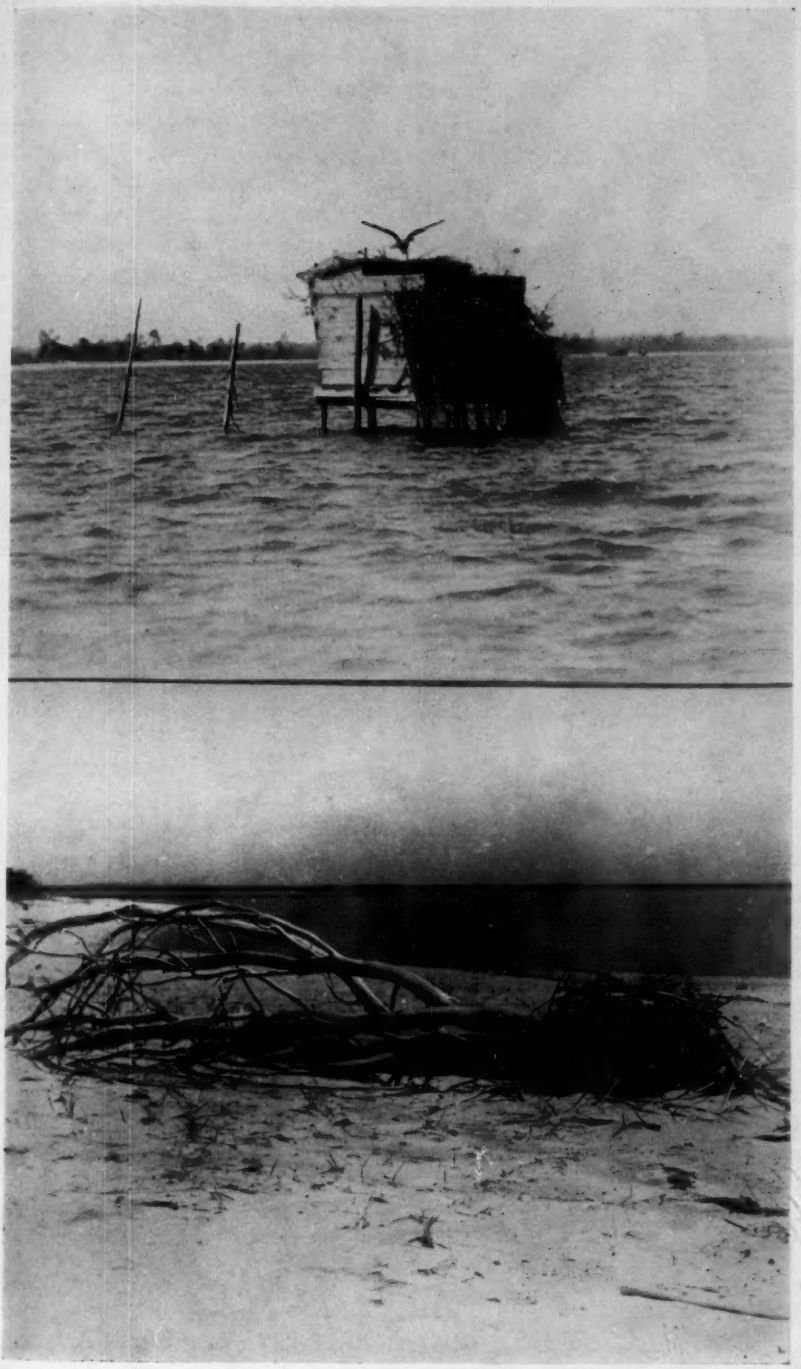
In banding the young it was usually necessary to lower them to the ground where the bands, which were rather difficult to manipulate, could be put on to better advantage.

The mortality of the young did not seem to be great. Two nests which each contained one young, at the first visit, were later found empty—possibly the work of Crows. A young man with whom I talked told of finding a dead, young bird, which from his description I believe must have been an Osprey. He said he found it in the corn field where he was working, its back torn away and half eaten. In nest No. 11, two of the young birds died, I believe, from the excessive heat. In nest No. 3, one young, the smallest of the three, was found dead; it may have been accidentally killed by the two larger birds.

The attitude of the adults towards our intrusion was varied, a good deal of individuality being shown. Generally, as we approached the nest, the birds flew off, crying excitedly, circling and swooping as we climbed nearer the nest. Their excitement often attracted others, until there were at times several pairs in the air above us. At three nests the birds swooped too close for comfort, one coming within two feet of Arthur's head.

The parental instinct in the old birds was strong; one let Arthur get within about ten feet of the nest before leaving. When we were finished at the nest, and had started down, they were soon back, shading the young with half spread wings, from the intense heat of the sun. Two nests from which old birds flew, with their usual excitement, proved to be empty, though still guarded. Always, on close approach to one of the nests near camp (from which the one young had disappeared), we were sure of a volley of abuse from the parent birds, which clung tenaciously to and protected the empty nest.

The action of the Osprey while fishing was exceedingly interesting. We had ample opportunity to watch them, for the splashing thud of the bird as it hit the water could be heard at all times of the day in the channel beside camp. As they fly along you can see the head move from side to side, watching any moving object in the water. At times they will hover over a spot, where they no doubt see a fish, circle, and hover again. In hovering they arch the body, spread the tail and seem to beat backwards with the wings, at the same time extending the legs. Suddenly, with wings half spread, feet and claws extended, they drop almost head first, hit the



UPPER.—OSPREYS' NEST IN A DUCK BLIND.
LOWER.—OSPREYS' NEST ON THE BEACH.

UNIV. OF MICH.

water with a splashing thud, and amid the spray almost completely disappear below the surface. With a few vigorous wing beats they rise—their prey dangling beneath them. Before flying far they give one or two convulsive shakes of the body to rid themselves of the surplus water and then, adjusting the fish beneath them—they always carry it head first, parallel to the body, fly off to their nest or some favorite perch to feed.

Often they sit on the stakes of nets near shore, and take fish out of the nets. Regardless of this, the fishermen have a high regard for them, never molest their nests and seldom kill a bird. We could not ask for better coöperation than we received from the people of the neighborhood. They were always ready and willing to give us information and help us in any way they could, as long as they knew that we were not going to harm or molest the Ospreys. We are especially grateful to Capt. Evan Gough, and his mother, Mrs. Retta A. Page, for their hospitality and coöperation.

### NESTS

76 nests located
25 nests—in which young were banded
13 nests—climbed to more than once
6 nests—found empty
2 nests—contained young, later missing
6 nests—contained 2 eggs each
1 nest—contained 4 eggs
1 nest—contained 4 young
12 nests—contained 3 young
15 nests—contained 2 young
6 nests—contained 1 young
all other nests contained 3 eggs each
67 nests located in pine trees
4 nests located on Duck blinds
2 nests located in gum trees
1 nest located in a cherry tree
1 nest located in an oak tree
1 nest located on the ground

### TABLE OF NESTS WITH NOTES REGARDING EACH.

1. June 16, on the edge of the Little Wicomico River, near Mrs. Page's home, in a dead and half rotten cherry limb, not reached, though young could be heard in the nest.

2. June 16, to the west of No. 1, on an unnamed cove, in a pitch pine, three young too small, banded on June 24—701255, 56, 57.

3. June 16, across the cove from No. 2, on the broken top of a pine, three young of unequal size too small to band. Banded on the 24th of June.—701258, 59, 60.

4. June 16, Smith's Point, one of the nearest nests to camp, from which three eggs were taken on April 29. Two eggs, nest often visited and still contained eggs on the 24th of June, probably not fertile.

5. June 16, near No. 4 in a scrub pine, three young too small to band. Banded on the 24th of June. 701238, 39, 40.

6. June 16, near No. 5 in a dead pine, three eggs were taken on the 29th of April, empty. (Pl. XI.)

7. June 16, near No. 6 in a scrub pine, not occupied.

8. June 16, near No. 7 in a scrub pine, one egg which hatched but young were too small to band on the 24th of June.

9. June 16, near No. 8 in a scrub pine, two eggs. Nest from which a set of 3 was taken on April 28. Hatched, but too small to band on the 24th.

10. June 16, near No. 9 in a scrub pine, two eggs. Nest from which a set of 3 was taken on April 28. Hatched, but too small to band on the 24th.

11. June 16, near No. 10. This nest, less than half a mile from camp, was the lowest occupied nest found. Therefore more work was done here than at any other nest. It was in the top of a scrub pine, nine feet six inches from the ground; was somewhat elliptical in shape with a long axis of five feet four inches, and a short axis of four feet. It was one foot six inches deep. On April 29 this nest contained one egg; on June 16 there were three newly hatched young. On June 17 a photograph was taken of the young as they lay panting in the nest. On the 19th they had changed but little, being darker and somewhat more active. By June 21—an exceedingly hot day—they had grown considerably, and their color had changed to the dark bluish so characteristic of the young of about the same age. (Pl. XIV, fig. 1.) On the 23d of June they were very dark, with a light brown streak down the back, eyes deep orange and bill nearly black. On June 24 two of the birds were dead from the heat and the third nearly so. (Pl. XIV, fig. 2.) The remaining bird was banded. 701252.

12. June 16, near No. 11, in a scrub pine, two young and one egg, June 23 the egg was gone; banded the two young. 701248, 49.

13. June 16, near No. 12, in a scrub pine about fifteen feet high contained one young, which was gone on the 18th.

14. June 16, near No. 13, in a pine, three young too small to band. Two young banded on June 24, 701250, 51. One still too small. This nest, the last visited on the 16th, was about a mile from camp.

15. June 17, nest in a large pitch pine about 300 yards from camp. Forty-one feet ten inches high, with a diameter of three feet seven inches, and two feet nine inches deep, contained one young only a day or two old. From this nest one could get a beautiful view up the Little Wicomico River.

16. June 17, about a mile from camp, just beyond nest No. 14, in a pitch pine, two young too small to band. Banded on June 23. 701231, 32.

17. June 17, near No. 16, in a pitch pine, one from which a set of three eggs was taken on April 28, contained one small young, which was gone on the 23d.

18. June 17, near No. 17, in a pitch pine, two young of unequal size and one egg, old birds very bold, flying close. Banded the two young on the 23d. 701229, 30.

19. June 17, near No. 18 in a dead and half-rotten pine, did not climb.

20. June 17, near No. 19. This nest, the farthest from camp in the continuous stretch of woods to the south, was a little more than a mile away. From this nest, which contained two eggs, a set of three was taken on the 28th of April.

21. June 17. This abandoned nest was found on the roots of a tree which had been washed up on the shore, when we returned to camp by way of the beach. Two broken eggshells were found at the side of the nest. (Pl. XII, fig. 2.)

22. June 18, to the west and south of camp, in a pitch pine, three young of unequal size too small to band. Two in the nest on the 24th, still too small.

23. June 18, near No. 22, in a half-dead pine, empty.

24. June 18, near No. 23, Nest forty-two feet six inches from the ground in a large pitch pine, contained two eggs. A set of three eggs was taken from this nest on April 28. From this next six Osprey nests and one Great Blue Heron nest could be seen.

25. June 18, near No. 24, abandoned.

26. June 18, Nest in a pitch pine, contained two eggs. A set of three eggs was taken from this nest on April 28.

27. June 19, This nest was on the edge of the first pond to the west of camp on the north side of the Little Wicomico River. It was on the top of a very thickly branched pitch pine, contained four young; three of which were old enough to band. 701205, 06, 07. These were the first Ospreys we banded. The old birds were very bold, coming very close to my head.

28. June 19, near the mouth of Tabs Creek, on top of a tall pine, climbed to the nest but could not reach the young, which I could hear.

29. June 19, near No. 28, nest on top of a tall dead pine stub, too rotten to climb, in which there were several Flicker nests.

30. June 19, near No. 29, nest in a small white oak, two young banded. 701203, 04. Adults swooped close to Arthur, who climbed the tree.

31. June 19, nest No. 30, nest in a low pine, three young banded. 701300, 701201, 02.

32. June 20, nest across the channel in a pine tree, two young too small to band. Banded on the 24th. 701253, 54.

33. June 20, nest on top of a Duck blind in the Great Wicomico River, near Sandy Point. One young too small to band and one egg. (Pl. XIII, fig. 1.)

34. June 20, nest on top of a Duck blind to the south of No. 33. Two young banded, 701212, 13.

35. June 20, nest on top of Duck blind to the south of No. 34, one young just hatched, still wet, and one egg. (Pl. XX, fig. 1.)

36. June 20, nest on top of Duck blind to the south of No. 35, one young banded, 701214, one addled egg.

37. June 20, nest in a pine on the south side of the mouth of Mill Creek, contained three young about one-third grown, banded. 701215, 16, 17.

38. June 20, nest near No. 37, in a pine, two well developed young, banded, 701218, 19.

39. June 21, nest in a pine on the edge of the second little cove to the north and west of camp on the north shore of the Little Wicomico River. A difficult tree to climb, nest empty, though an adult flew from the nest at our approach, broken eggs at the base of the tree, probably by Crows.

40. June 21, on the same cove as No. 39. A most difficult tree to climb, nest overhung the water. Two young too small to band.

41. June 21, another nest in a pine on the same cove as No. 40, empty.

42. June 21, nest in a pine on the edge of a cove about a mile and a half from camp, on the north shore of the Little Wicomico River, to the east of Ellyson Creek. Three young large enough to band, 701220, 21, 22. (Pl. XIII, fig. 2.)

43. June 21, in the same cove as No. 42, nest in a pine containing one young large enough to band. 701223.

44. June 21, on the opposite shore from No. 43, nest in a pine containing two young too small to band.

45. June 21, near No. 44, nest forty-four feet from the ground in a large pitch pine, two young large enough to band, 701224, 25.

46. June 22, nest in a pine on the east shore of Tabs Creek, three well developed young, banded. 701241, 42, 43. Very hot and the female reluctant to leave her young, coming within two feet of Arthur's head. Covered young with expanded wings as soon as he was out of the tree.

47. June 22, nest about twenty-five feet high, in a large pitch pine, nine feet in circumference, two young banded. 701245, 47. Near the head of Tabs Creek.

48. June 22, near No. 47 in a pine, seemed to be abandoned, not climbed.

49. June 22, near No. 48, in a tall, spindly pine, doubtful if the nest could be reached. Not climbed.

50. June 22, near No. 49, nest in a pine the trunk of which was covered with poison ivy. Not climbed.

51. June 22, near No. 50; too much poison ivy; not climbed.

52. June 22, Arthur climbed to a nest in a scrub pine, near the mouth of Bridge Creek, and the female did not leave the nest until he was about ten feet from it. Two young too small to band.

53. June 22, near No. 52, nest in a pine, two young old enough to band. 701244, 46.

54. June 22, near No. 53, nest in pine, climbed to; but empty.

55. June 22, to the east of Sunnybank, too tired to climb a difficult tree.

56. June 23, nest near camp, not previously found, three young well developed, banded. 701226, 27, 28.

57. June 23, nest on top of a pine whose trunk was covered with trumpet flower vines, on the edge of Rock Hole, about a mile and a half from camp. Fresh clover hay in the nest—three half-grown young, banded. 701233, 34, 35.

58. June 23, south of nest No. 57, on the edge of a little pond, on a lateral branch of a large gum tree. Not climbed.

59. June 23, north of No. 57, in a pine tree. Two young that are the furthest developed of any we have yet seen. Banded. 701236, 37.

60 to 73. June 23, thirteen nests on the shore of Owens Pond, all but one located in pine trees, some estimated to be sixty or seventy feet high. One on the top of a broken limb of a gum tree. Two nests were climbed to but they were both empty. With a little more time many other nests could be located, no doubt, for we only covered about half of the pond.

74. June 24, nest in a pine near No. 3, it was too late in the day to try to climb it.

75. June 20, near No. 40, on the lateral limb of a pine—inaccessible.

76. June 20, near the original mouth of the Little Wicomico River, in a tall, isolated pine, difficult of access—not visited.

*404 Frederick Road*
*Catonsville, Md.*

UPPER.—YOUNG OSPREY, A DAY OR TWO OLD, AND EGG IN DUCK BLIND NEST. LOWER.—YOUNG OSPREYS ABOUT FIVE DAYS OLD. BACK-BONE OF LARGE FISH BEHIND THEM.

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UPPER.—YOUNG OSPREYS ABOUT SEVEN DAYS OLD.
LOWER.—ONE OF ABOVE YOUNG ABOUT TEN DAYS OLD.

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# COURTSHIP AND SEXUAL SELECTION OF THE FLICKER (*COLAPTES AURATUS LUTEUS*).

BY G. K. NOBLE.

*Plates XV–XVI.*

THE Flicker has the distinction of being especially singled out by Darwin (1871) as supporting his theory of sexual selection. He states that Audubon "does not doubt that the female deliberately chooses her mate; . . . the hen is followed by half a dozen gay suitors, who continue performing strange antics, 'until a marked preference is shewn for one'." The Flicker is further distinguished among local Woodpeckers by the brilliant yellow tones to the undersurface of wings and tail. Darwin did not refer to these bright colors as having been especially evolved by sexual selection. The fact that they are equally developed in both sexes he would probably attribute, as he did with other birds, to their transference to the female after they had been acquired in the male through female choice.

Huxley (1916, 1923) has shown, however, that in many cases where both sexes are adorned there may be a mutual performance and mutual selection of the more attractive partners. Moffat (1903), Guenther (1909) and Hingston (1933) on the other hand have stressed that sexual selection may be an illusion, the conspicuous colors having arisen as intimidating and not attracting devices. In some lower vertebrates it seems certain that the bright colors of the male have only this function (Noble 1934). Much has been written on the courtship of the Flicker since Audubon's day, but no agreement has been reached as to the functional significance of the bright colors.

## PREVIOUS WORK.

It has long been known that the courtship of the Flicker differs from that of other local Woodpeckers in that two or more females may gather about a single male and apparently compete with one another for his attention. Baskett (1897), Burns (1900), Sherman (1910), Patton (1926) and Johnson (1934) cite particular instances and various other writers such as Forbush (1927) speak of the habit as a general procedure. On the other hand few observers have been able to give first hand information which would support Audubon's contention (1832) that half a dozen "gay suitors" may be attracted to a single female. To be sure some writers such as Burns (1900) speak of such a habit as a common occurrence but they do not cite cases and it seems probable that they are basing their assumption on Audubon. All observers have been impressed by the apparent good nature of the courtship displays. When females were competing among themselves,

"there were the same struttings . . . and bowing that is practiced by the males in a similar situation" (Sherman 1910). "The heads are tilted back at times and the bills pointed up at an angle of sixty degrees with the necks outstretched. The bills, heads and necks are kept in constant motion, reminding one of a musical director's baton" (Skinner 1928). It is not surprising that many writers have described these movements as a dance and the question arises: May there not be after all some mutual selection in this performance which bears a certain resemblance to the mutual ceremonies of Grebes and Herons?

Recently Johnson (1934) has given a very detailed account of the courtship of a particular male Flicker:

". . . the acquisition of a mate by this Flicker was an undertaking that required practically an entire month. As early as the fourth day he had, by effective broadcasting, succeeded in attracting no less than three good 'prospects'. One of these entrants in the elimination contest, so to speak, withdrew early. Each of the remaining two was the determined kind, apparently; neither would yield, and a deadlock threatened. The male, meanwhile, from all appearances, assumed a neutral, wholly impartial attitude toward the two rivals. He even went so far as to continue to broadcast his advertisements, as if serving notice that he felt under no obligation to restrict his choice—if he really had any choice—to these two. But no further candidates responded . . ."

Johnson, however, found no evidence that the dance was stimulating to the male. "The two remaining females chased each other about in a mildly belligerent fashion, spreading their tails and erecting their crown feathers, and at the same time uttering a weak 'weechu-weechu'. They followed each other about thus, along the larger limbs of the nest-hole tree as well as on another tree a few yards away. Jealousy was evident."

## METHOD OF STUDY.

I have been interested to repeat Johnson's observations on another Flicker throughout the courting season. Thanks to the coöperation of the Department of Education of the American Museum I was able to introduce mounted birds of both sexes at critical moments in the cycle. This procedure has yielded new evidence as to the significance of the display. I have also found it possible to glue a "moustache" on the face of a living female bird with the result that an accepted mate was transformed into a "rival male." Control experiments were made with the same female after the moustache had been removed. The results have shed light on the significance of the moustache in the life of the bird.

## OBSERVATIONS AND EXPERIMENTS.

During the last week of April, 1935, a male Flicker was giving his long "Flicker call"[1] at frequent intervals from a bare limb near the top of an elm in my yard at Englewood, N. J. On May 1, apparently the same male began a hole on a willow 96 feet from the elm. On May 2, he was joined by a female but continued to work well within the orifice while she showed her interest by pecking at intervals around the entrance.

In order to test the ability of these two birds to recognize sex I placed a pair of mounted Flickers on the same limb as the hole but from 12 to 16 feet away. The mounted birds were posed in a resting position with heads turned at very nearly the same angle and they were placed at various distances from one another, sometimes the male nearer the hole and again the female. The test was first made on May 2 and repeated every morning until May 9. The test period was approximately two hours between 6.30 and 8.30 A.M.

The Flickers distinguished between the sexes of the two mounted birds on every occasion. The female would attack the female mount and the male the male mount. A second mounted female added to the pair brought forth the same response as the other female mount. The female Flicker was far more aggressive than the male and once she had knocked a female mount to the ground she would dive at the male mount. If her mate was close at hand she would also peck at him. On rare occasions the male Flicker would attack the female mount after knocking down the male one. The female Flicker alone would follow the mounts to the ground and peck viciously at them.

Both birds when attacking gave only the familiar we-cup call of the breeding season. The bill was directed forward and upward, the head bobbed, the tail flitted in the so-called "dance." The whole performance was obviously intimidatory. Both birds added to it a movement which I am not aware has been previously described. As an attacking bird approached the particular object of its indignation, the tail would be lifted from the limb and spread. Then with a sudden movement it would be tilted at an angle of 45° or more to the limb exposing the brilliant undersurface. The male tilted his tail more than the female did but in both the object was to flash suddenly the yellow fan in the face of the apparent adversary. A record of one trial will illustrate:

"May 3, 8 A.M. Male mount placed sixteen feet from hole and female mount three feet nearer it. Male Flicker, first to return to tree, moves down limb giving loud we-cup calls with usual head movements. He circles

[1] Saunders (1935) describes this call as wick-wick-wick. It is not to be confused with another call Saunders describes as ooweeka but Roberts (1932) as flick-ah, flick-ah. I follow Burns 1900 in writing the latter as "we-cup."

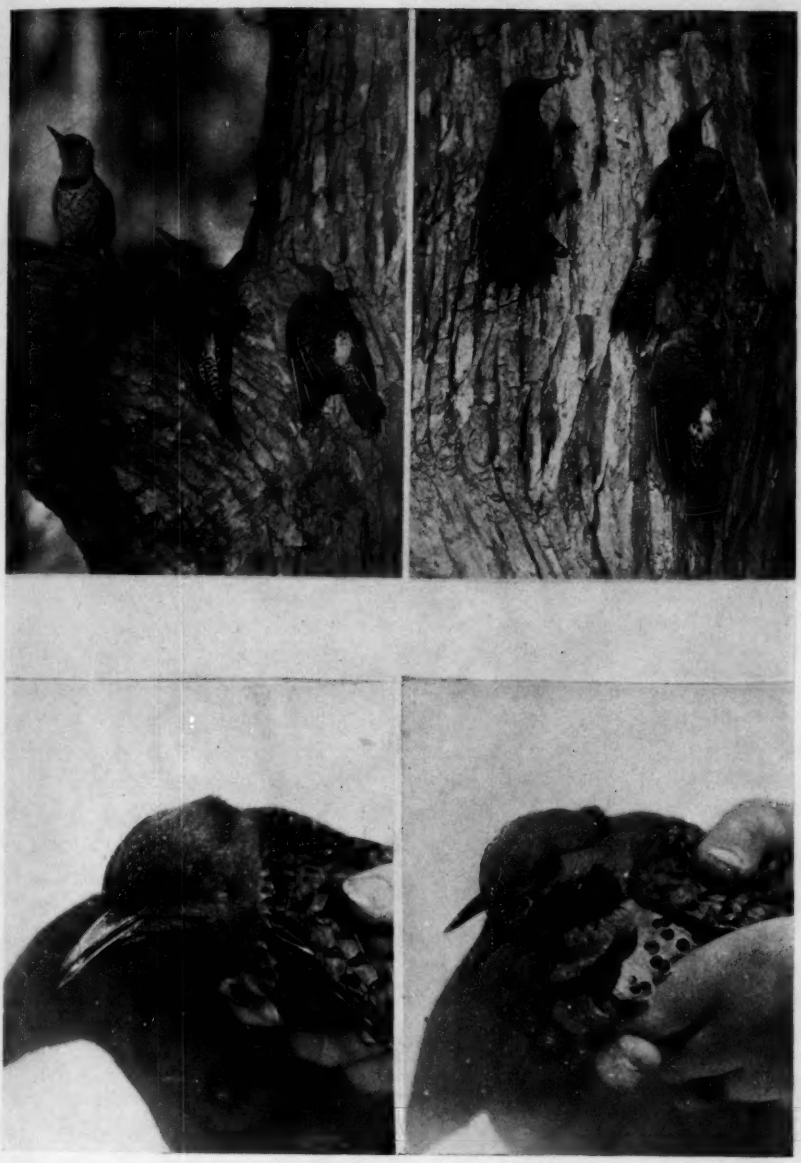
female mount and when one foot from male mount tilts his widely spread tail nearly to a vertical position, fully exposing its bright underside. Moving nearer, the Flicker pecks at mount, spreads and displays tail as before then pecks again several times until the mount falls. Then the Flicker turns to female mount, spreads tail but tilts it only slightly. He pecks at mount and knocks it to the ground."

The female Flicker would also move around the mount of the opposite sex in order to attack the mount of her own sex first. On May 4, for example she attacked the female mount seven times in succession. The female's persistence in following up her attack frequently resulted in her ignoring the male mount entirely. Thus on May 5, the female knocked the female mount down ten times during a period she knocked the male mount down only three times. Both were attached to the limb in such a manner that a vigorous thrust would disengage either one and hence these figures are a fair indication of the relative frequency the female ignored the male mount.

The limb on which the mounts were placed slanted upward at a gentle incline. Obviously the greater the incline the greater the difficulty a Woodpecker would have in displaying the under surface of its tail. An opportunity to test the Flickers on a vertical surface was given by the birds themselves. On May 3 the male, possibly disturbed by the tests of the previous day, began a second hole in a red oak 46 feet from the willow and 100 feet from the elm which had served as a calling station. The hole was begun in the trunk, approximately thirty feet from the ground. The pair of mounted birds placed twenty-four feet from the hole and only six feet from the ground brought forth the same we-cup calls, head bobbing and attacks but the tail while fully spread and slightly tilted showed very little of its undersurface.

When a single mounted bird was placed on either the willow or the oak the response differed in accordance with the sex of the mounted bird. The male would approach a mounted female and sit near it for long periods usually bobbing its head and we-cupping softly at intervals. If the female Flicker returned alone she would soon begin a vigorous attack upon the mounted female.

When the male mount alone was exposed the female Flicker would we-cup loudly and fly to the vicinity but she would never take up a position a few inches away and we-cup softly. There was therefore a markedly different attitude of the two Flickers towards mounted birds of opposite sex (Pl. XV, upper). The male would approach and without displaying give the same cry and head movements utilized in an attack but all scaled down to a very gentle performance. Moreover there would be long periods when the male would remain quiescent near the female mount.



UPPER LEFT.—MALE FLICKER (LEFT) PROTESTING TO MOUNTED MALE (CENTER).
RIGHT.—FEMALE (LEFT) READY TO ATTACK MOUNTED FEMALE (BELOW).
LOWER.—FEMALE FLICKER BEFORE AND AFTER "MOUSTACHE" WAS ATTACHED.

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The female's failure to perform the same way towards the male mount may have been due to her lack of interest in a silent male but there was another factor to consider. This particular female may have been mated to the male, the resulting bond modifying the response to the visual image of a bird of the opposite sex. When two or more mounted birds were placed on either tree she would frequently direct her we-cup calls at her mate. On at least one occasion when a male mount was present she went behind the male Flicker and attempted to drive him toward the male mount. As a rule when two or more mounts were exposed the female would we-cup loudly until the male flew into the same tree and then she would immediately begin her attack on the female mount. It was clear that the attack of the female was greatly enhanced by the presence of the male in the vicinity. His we-cup calling, his movements urged her on to single handed attacks which she apparently dared not perform alone. If the male was present the female would knock the male mount down, a feat she never accomplished alone. A record from one of the tests made May 7 will illustrate:

"Male mount placed along six feet from ground on trunk of oak. The female approaches calling and takes up position a few feet away but will not attack. Five minutes later the male flies in and alights on trunk. The female immediately attacks male mount and knocks it down.

"Male mount placed on the willow 12 feet from the hole. The female flies to limb we-cupping loudly and moves from four feet to eight inches of the mount but will not attack. She remains for 25 minutes in this position we-cupping loudly every 20 to 60 seconds. Male mount is then moved back to the oak. Male Flicker settles down ten inches from mount behind and slightly to the right. Every 45 seconds he we-cups loudly. Several minutes later the female arrives and he immediately attacks. Female seems to strike the blow which knocks the male mount down."

It might seem from this observation that the male was passing out of cycle and that the female was the more vigorous in defending territory. But a copulation was observed the preceding day and also on many later occasions. Hence it would seem more probable that the male's response always less vigorous than the female's had merely been dulled to such an extent that he required the presence of the female in order to complete an attack on the quiescent form of a mounted male bird. On the following day the male drove a Starling from the hole in the willow and displayed the underside of his tail at a male mount placed between two female mounts 12 feet from this hole. Hence the male, although still sufficiently motivated to attempt intimidation of a "rival" by his tail display, would not direct an attack on the quiet form.

Under normal conditions a rival Flicker would obviously not remain quiet but would answer the challenge of we-cups with a similar cry. It

seemed very desirable to secure further information by the introduction of live birds into the situation. Any new male released near the trees would, of course, soon fly away. Hence it was decided to masquerade the female as a male for she obviously was interested in his territory. I am not aware that such masquerading has been previously attempted but in the Flicker it does not present great difficulties in that the male differs from the female chiefly in his black "moustache." Catching the particular female also was not difficult since her jealousy would invariably cause her to knock a mounted female to the ground. A string was attached to the neck of the mount and after it was struck down it was pulled closely followed by the viciously pecking female into a drop trap. The feathers were then cut from the area the moustache occupies in the male and a series of short black feathers secured from the neck of a dried skin of a Pileated Woodpecker was attached to the cut ends with ambroid cement. The resulting transformation was a fair likeness of a male Flicker (Pl. XV, lower). With time the feathers became rubbed the wrong way and failed to lie smoothly. But certainly the first test was made with a bird that resembled a male Flicker closely.

The female was caught the morning of May 11, and after the moustache had been attached the bird was released at 11 A.M. fifty yards from the oak. She flew straight towards the hole and alighted on its edge. The male was not there and she remained for ten seconds alternately peering into the hole and looking about outside. A moment later the male flew in and dropped down beside her. As soon as he alighted he spread his tail and tilted it slightly. The female hopped to a branch a foot and a half away and stopped with head directed away from the male. Immediately the male leaped on her back and brought his tail down in a typical copulatory manner. A moment later he stepped from her back and at the same instant the female turned her head. With a start he drew back and recovering his balance, lunged viciously forward. Then began a long drive which lasted nearly two hours and a half. Along the branches, back to the trunk, up to the nest hole and again out on the branches the male mercilessly pursued the moustached female. As he drew near his tail was spread and tilted displaying the bright under surfaces to their maximum. The male at first made no sound but within a few minutes the female began to we-cup softly. Frequently the female lifted her wings in defense as the male pecked at her head. At no time did she fight back although our previous experiments had shown her to be a more valiant defender of territory than the male. Again and again she returned to the hole only to receive such an onslaught that she lost her balance and fell several feet before catching hold of a branch. After ten minutes of rough treatment the female led the male away from the oak and five minutes later the male returned alone. Two

minutes later the female returned and again we-cupped softly as the male drove her out on a limb. A moment later she dove to the ground, the male following and holding his tilted tail nearly vertical he gave an extraordinary display before lunging at her again. Once more she flew away and this time it was possible to follow the pair as they scrambled over a burnt field a hundred yards beyond the elm which had seemed to be on the edge of the male's territory.

It might be assumed that the male was not confusing the moustached female with a rival but was merely annoyed by the "foreign objects" on the person of his mate. Obviously a control was required at this point and this again was fortunately supplied by the same birds. At 1.30 the male drove the female into a culvert where she was captured. Since both birds were tired from the strenuous chase, it was decided to run the control the next morning.

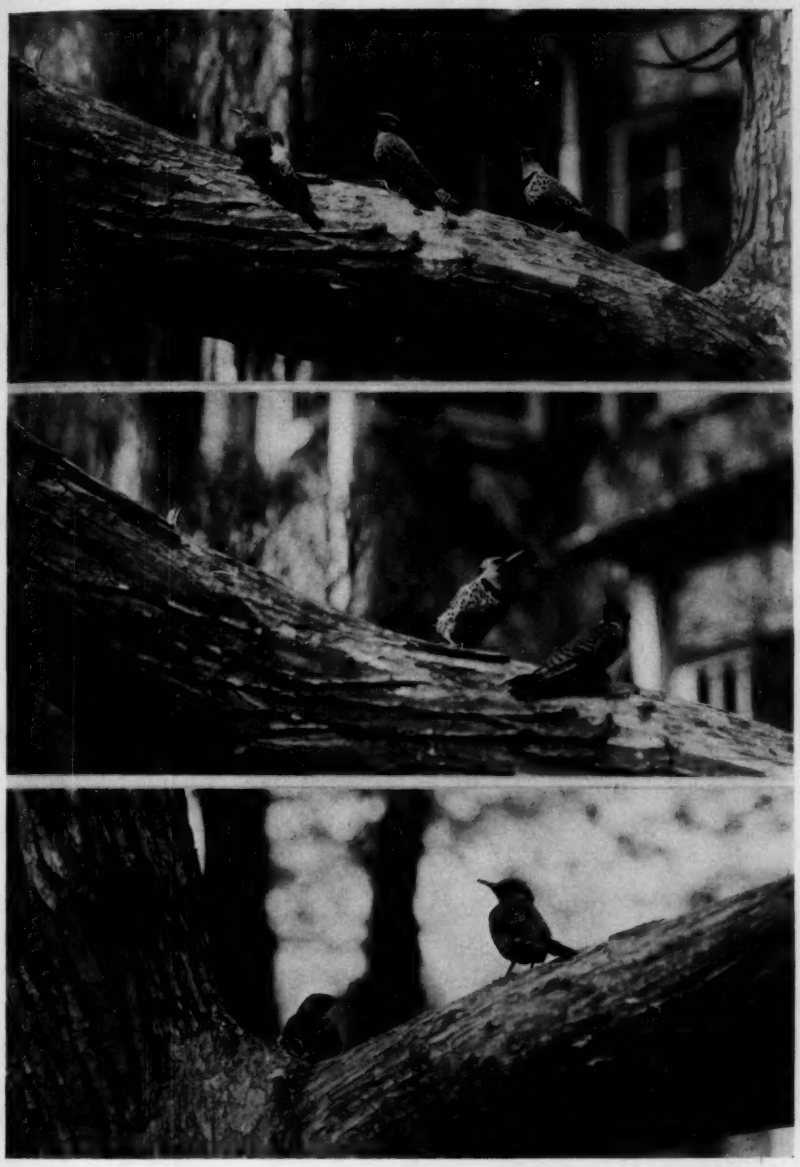
At 6.30 the next morning the male was back on the elm, his original calling station, and giving loud Flicker calls. These were interspersed with loud drummings on the same dead limb he had used before the female arrived. At odd intervals explosive *clapes* were ejaculated. The moustached female was staked out in exactly the same position on the willow that the mounted male had been and a mounted female was placed six feet nearer the nesting hole. The calling male came at once and walked around the mounted female to tail display and then lunge at the moustached female. In order to keep the female in good health the male was frightened away every time he pecked at the live bird. When approached the female usually we-cupped softly, the male loudly, while spreading his tail. When he was out of sight the female occasionally gave a short Flicker call and this was answered in the same manner but with more volume by the male who usually flew back at once. It was obvious that both the we-cup call and the Flicker call of the female attracted the male. During twenty-eight trials with the mounted female in the usual path of approach the male showed not the slightest interest in this quiescent form but directed efforts towards displaying before and then attacking the moustached female (Pl. XVI, uppre).

Since the male was frightened away at each of these twenty-eight trials his attacks at last began to become less vicious. At the same time his we-cupping became louder and more sustained. Previously it was found that the male when attacking a mounted male we-cupped more than he fought. When driving the moustached female he was at first very vicious and at the same time he called very little. Hence there appears to be an inverse ratio between the degree of vigor in the attack and the amount of we-cupping given. As the drive became less intense, there appeared to be no difference between the male's attack on a mounted male and moustached female.

It might be argued that in spite of this resemblance the male was, nevertheless, not attacking an apparent rival but merely an abnormally marked female. As the tests continued the artificial moustache became rumpled and as shown in the photograph (Pl. XVI, center) actually darkened more of the throat than when freshly attached. In order to test the importance of this rumpling factor, the black moustache was cut away and a series of feathers from the throat of a female Flicker skin were roughly stuck to the same areas with ambroid cement. Three hours after this new transformation the female was placed again where she had been tied before but now a mounted male Flicker was placed six feet nearer the nesting hole. The female gave the short and subdued Flicker call and the male came at once to display the underside of his spread tail at the male mount. Receiving no reply the male moved on to the redecorated female who lunged at him savagely as he drew close. The quiet approach of the male encouraged the female to attack him in a way she had not done before. Although she pecked at the male he did not peck back. He was content to walk about her while displaying the under surface of his spread tail. Three minutes later he flew to the elm and drummed. Two minutes later he was back on the willow tail-displaying and we-cupping at the male mount. As he approached the female she struggled and he we-cupped and tail-displayed. Again he flew away without striking the female and drummed on the elm. Again a long Flicker call was given from the elm and four minutes later the male returned to the willow. This time he remained we-cupping, head-bobbing and tail-displaying before the male mount without moving nearer the live female.

At 5 P.M., two hours and a half after beginning these tests with the redecorated female the latter was moved to a crotch twenty feet from the nesting hole. The male soon flew directly to her and sat quietly a few inches from her for several minutes (Pl. XVI, lower). When the female was then staked out on the ground at the foot of the oak the male flew to her and after displaying the underside of his tail settled down a few inches away we-cupping softly. From all appearances the redecorated female had again been accepted as a mate.

Although the normal courtship of the Flicker might be reconstructed from the responses of these two birds to one another and to the mounted birds, the question remained: Would the presence of several live individuals of one sex modify the picture? Opportunity to test this question came the next morning. The redecorated female although apparently remated was returned for the night to a cage. At 6.20 A.M. the next day two new females were fighting on the edge of the nesting hole in the oak. Their loud we-cups were identical to the cries given by the original female when attacking the mounted bird of her own sex. At 6.28 the male arrived and one of the



UPPER.—MALE FLICKER (RIGHT) WITH SPREAD TAIL. BIRD ON LEFT IS A MOUNTED FEMALE.

CENTER.—MALE DISPLAYING UNDER SURFACE OF TAIL TO HIS MATE NOW TRANSFORMED INTO A RIVAL.

LOWER.—SAME FEMALE WITH "MOUSTACHE" REMOVED. THE MALE IS NOW ATTRACTED BY HER AND DOES NOT DISPLAY NOR ATTEMPT TO INTIMIDATE HER.

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females who for the moment had driven off the other female turned away from the hole giving a nasal *we-we-we*, like the first syllable of the we-cup but more plaintive and repeated without the *cup*. She moved along a limb and squatted cross-wise the male following and coition occurred. Here was a distinct call-to-mate which has apparently not been described previously for the Flicker. Observations on the following days showed that this was the normal procedure for this female at least. Two previous coitions had been witnessed in the case of the first female and neither time was a distinctive mating cry heard. But in both these cases the female moved off and suddenly stopped, this movement alone apparently inducing the mating response in the male. From 6.30 to 7.15 A.M. (daylight saving time) the two females contended for a place near the entrance to the nesting hole in the oak. They we-cupped loudly, spread their tails and tilted them to expose the under surfaces fully. When the females called the male thrust his head out of the orifice or flew near the contending females but he never displayed to them. When one female was driven off the other approached the male and we-cupped gently. The head was bobbed and the tail flitted in the usual way but with much less vigor than when driving a female.

At 7.15 A.M. one of the females gave the plaintive we-we call and hopped along a branch, crouched cross-wise and coition occurred. Five minutes later the male was again attracted by the same call and he hopped almost automatically after the female until she stopped when coition again took place. During this period of mating as during the previous one only one female was present in the oak with the male. Neither he nor she displayed nor stimulated one another by a dance. At a moment of quiet the female merely gave a distinctive call and the male followed until the female stopped when copulation followed.

At 7.20 another severe epidemic of we-cupping broke out as the second female alighted on the oak. The male who was within the hole immediately left and flew to the females but again did not enter into their displays. The female who had mated soon drove the second female off and immediately returned to the lower edge of the nesting hole. At 7.40 she entered the hole while the male rested twenty feet away on a limb.

The next morning, May 14, copulation occurred again at 7.03 and it was preceded by exactly the same call and movements by the female. At 7.05 another female alighted on a tree fifty yards from the oak. Both birds flew to the new-comer but only the female displayed her tail or lunged at the new bird. The male was content to sit on a limb and we-cup softly. When the male moved the female dove at the new bird, obviously encouraged by the presence of the male. At 7.08 the first female returned to the oak and engaged the new female in another squabble. At 7.12 all three were in the elm where the male who took no part in the fight began to drum.

Immediately a female flew to within three feet of him and we-cupped rapidly. The male drummed again and the female bowed and we-cupped. A minute later the male repeated the drumming with the result that the second female appeared. The first female flew at her and drove her off. But she returned at 7.40 and the females displayed. At 7.41 the male flew away, leaving the females who in his absence sat three feet apart and we-cupped at one another without changing their positions. At 7.47 the male returned and this action caused the females to approach immediately and tail-display while we-cupping loudly. A moment later the male gave a short Flicker call and one of the females flew to him and gave a plaintive invitation-to-mate while hopping away from him along one of the limbs. Immediately the other female flew at her and we-cupped excitedly with the result that she was driven off.

From 7.58 until 9.30 the three birds were kept under continuous observation. The dominant female when at rest held her head more extended than the other. It was the dominant female which settled at frequent intervals on the edge of the nesting hole in the oak. If the male left the oak both females would quiet down but his return would start another bout of tail displays and we-cupping. Rarely did one female strike the other but the tail displays were more frequent and conspicuous than those which had been directed toward the mounted birds. If the male entered the nesting hole, the dominant female would at once fly to her position immediately below the orifice. With the male out of sight the we-cups of the females would weaken. Once the two females rested only ten inches apart and immediately below the orifice through which the male had passed. There was no doubt that the presence of the male was essential for the females to continue their battle of we-cups and displays at the maximum pitch. On one occasion the dominant female entered the hole but immediately left it when the male appeared.

Although the male was attracted by a we-cupping bout between the females he made no attempt to keep nearer one than the other. It was the dominant female who entered the hole and in securing this favorable position she was nearer his center of activity. Whether she alone had actually copulated with the male was uncertain because the females could be distinguished only by their head carriage and this for only a comparatively short time.

By the next morning one of the females had driven off the other. On this day copulation occurred at 6.25 A.M. and again at 6.50 P.M. Both acts were preceded by the nasal invitation-to-mate of the female. The first mating was near the nesting hole in the oak and the female moved away in the usual way. The second occurred in the elm and the female moved towards the male and turned transversely to the axis of the limb when she

was two feet from him. The male hopped across her depressed body but as the female continued to give the call he turned and stepped on her back. As he brought his tail down he lost balance and tilted over until his left side was against the branch. These two matings were again preceded by no display, dance or sound other than the nasal invitation-to-mate of the female.

By May 16 the pair seemed to be definitely established in the nesting hole in the oak and the second female driven away. The original female with her artificial cheek feathers still very bristly was therefore placed on the willow to see if the male would still respond to her presence. Within ten seconds the male had flown to the limb and began to give the short Flicker call. Then he moved down the limb and stood beside her while she lunged at him. The male we-cupped softly but the female obviously annoyed by the cords which held her feet firmly to the middle of the limb made no reply. After remaining near the female for three minutes he suddenly pecked at her. She fenced with him and then there was another wait of several minutes. Apparently the male recognized her as a female but was annoyed by her struggles and failure to reply to his we-cups.

The following morning the test was repeated with the same result. The male came again and stood close to the female. But this time as the female lunged she broke loose from the cords which held her feet and flew away closely followed by the male. An hour later the male had returned to the nesting hole in the oak and the second female met him with feeble we-cups. The original female never returned to the territory and the second female was allowed to rear a brood without further disturbance.

These observations and experiments had showed that the "dance" of the Flickers was in no sense a method of attracting or stimulating individuals of the opposite sex, but rather a means of defending territory and driving off rivals. After the young were reared it seemed desirable to test the responses of the pair again to mounted birds of the same and opposite sex. Since a male, presumably the same male, retained the nesting hole in the oak as a retreat, the pair of mounted Flickers employed in the previous tests was attached to the trunk of the tree twenty-five feet below the hole. The male mount was placed directly above the female mount and 14 inches from it. Soon the male returned and with the usual head bobbing he we-cupped as he approached the mounts. Then followed a long period of waiting broken from time to time by short we-cup calls, head bobbing and feeble tail displays. As he called he edged nearer and 31 minutes later he gave the female mount a poke which knocked it down. He then moved on to the male mount and called, craned his neck and flitted his tail exactly as he had done to the female mount. Eventually he knocked the male mount down, and later the female mount again. But the performance was

chiefly characterized by long periods of waiting near one mount or the other. In the course of the morning he was within six inches of the female mount for 42 minutes, the male mount for 37 minutes and half way between the two for 26 minutes. There was obviously at this late date no differential response to the sex of a mounted bird. The male was intent on driving the mounts from his old nesting and present roosting tree. To accomplish this end he utilized the we-cup calls, head bobbing, tail flitting and display he had employed earlier in the season. But the whole performance was less intense and only once was the tail spread and tilted to the full extent. This was directed towards the male mount which the Flicker did not attack but only addressed his feeble we-cups while settling down six inches away.

## DISCUSSION.

It is clear from the above observations and experiments that the "dance" of the Flicker has been usually misinterpreted. The male gives his long Flicker call and his drumming performance from some high point of vantage. Females are attracted to the site, late in the season at least, with great rapidity. When two or more females arrive there is great competition between them. They employ the head bobbing with up-tilted bill, the loud we-cup calls, the tail and wing flitting as means of intimidating the rival. The most dramatic gesture is a wide spreading of the tail and tilting of it until the bright under surface is fully exposed to the opponent. The male employs exactly the same methods of intimidation when a rival male appears. He is attracted by the we-cupping of two females and they require his presence in order to battle to their fullest extent. Each female endeavors to secure a place near the male or near his nesting hole but they do not stimulate him by special displays or by movements. The fact that a female often we-cups when only a male is present must be attributed to excessive excitement. Once she is alone with a male whose sex she recognizes there is no display and only a mild form of we-cupping.

When a female is ready to breed and has driven off her rival she gives a distinctive call while moving along a limb. This invariably causes the male to follow and mate. Coition may occur without this invitation-to-mate but in this case the female moves away and stops as in the first case. A male is willing to fly near any female which appears in his territory. Although he may we-cup and spread his tail towards her this is more a test of her intention to stay than an effort to attract her. If she remains, his we-cupping like hers becomes feebler and eventually dies away entirely.

A quiescent female form is not a sexual object to a male Flicker. Unlike many other birds which will mate with mounted birds (Noble and Vogt 1935) he requires a distinctive cry from the female to release his copulatory behavior. Various other birds are known to have a similar invitation call.

In the Song Sparrow Nice (1933) has described this as a nasal *eeeeee*. During 1935 I made many attempts to induce unmated and calling male Song Sparrows to mate with mounted individuals of their own species. Occasionally the male would sit for long periods near the mount, more usually he would attack it, but he never mated with it.

While in the Song Sparrow and Pigeon, sex is recognized by voice and behavior, mature Flickers apparently have learned to recognize the moustache as a badge of maleness. The response to a female bearing an artificial moustache was much more vigorous than that to a mounted male. This, however, was to be explained by the greater stimulation of a moving object.

Unfortunately only one live male was available for these observations and experiments. His behavior was apparently identical to the male described by Johnson (1934). It may be assumed that not rarely more than one female is attracted to a single male. At these times her hidden colors are flashed out to intimidate her rivals. The male's gladiatorial vestment is also reserved primarily for impressing a rival. It follows that sexual selection in the Darwinian sense, that of female choice, has played no rôle in enhancing the color of the Flicker. Natural selection alone is adequate to account for the bright yellow colors.

## CONCLUSIONS.

The we-cup call, the head bobbing with uptilted bill, the wing and tail flitting are means that Flickers of both sexes employ to intimidate rivals. The extreme display is a wide-spreading of the tail and a tilting at an angle of 45 degrees or more exposing its bright yellow under surfaces to the rival.

When two females come to a calling male there is keen rivalry between them. The male is attracted by their calls and they are stimulated by his presence but he takes no active part in aiding one or the other in the contest.

When a female has driven off her rivals she may induce the male to mate by giving a nasal call heard on no other occasion. This invitation-to-mate is given while the female moves along a limb and then crouches. Coition may proceed without the call provided the female moves and stops in the same way. It is not immediately preceded by any displays or dances on the part of either bird.

The "moustache" of the male is a badge of maleness and will call forth an attack by a territory guarding male even when artificially attached to a female apparently mated with him. Males readily distinguish the sex of mounted birds placed within their territory. Early in the season before the nesting holes have been fully constructed the female is more vigorous in attacking a mounted female than a male is a mounted male. In the excitement of the attack she may strike her mate or the mounted bird of the opposite sex but in general she distinguishes between the sexes.

After the young have left the nest the male may still defend the nesting hole but he treats both sexes of mounted birds the same way.

The bright yellow colors of the concealed surfaces of Flickers have not evolved through Darwinian sexual selection, that is through female choice, nor through mutual selection as defined by Huxley. Their chief function is to intimidate and hence natural selection alone is adequate to account for their genesis.

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# THE RELATION OF FIELD CHARACTERS TO THE QUESTION OF SPECIES AND SUBSPECIES.

BY ARETAS A. SAUNDERS.

IN A recent number of 'The Auk,' Dr. Stone[1] has ably discussed the subspecies question, bringing the various ideas that have been expressed on the subject up to date. For some years I had been entertaining a number of ideas concerning the relationships of species and subspecies. Dr. Stone's paper served to clarify these ideas, and I am presenting them here.

It has been generally considered that the museum ornithologist with large series of skins to study, is the final authority on all questions as to what are species and subspecies. The field ornithologist, that is, the student of living birds in their natural environments, is not supposed to have anything to say about it. But the facts are that the moment a bird is dead it has lost a large number of the characters of the species to which it belongs. Its characteristic habits and actions, its call-notes, alarm-notes, songs, the habitat it selects in which to breed, the type of nest its instinct prompts it to build, and the kind of place in which its nest is located are all just as much characters of the species as are the coloration of its feathers and the length of its wing or tarsus.

When two species in the same genus differ only slightly in coloration, but widely in these field characters, the degree of difference seems, to the field man, much greater than it does to the museum man. Conversely, when species do not differ in these field characters, even though their plumages are quite distinct, there is reason to think that the degree of difference is really less than the museum man is likely to make it.

Many years ago Coues,[2] discussing the Eastern and Western Wood Pewees, wrote, "We may have to acknowledge, in some cases, that species are better determined in the field than in the closet. If this be true in any case, it holds with the little flycatchers."

I should hesitate to identify the Least and Alder Flycatchers in the field by sight alone. I should have greater certainty in separating two such subspecies as the Prairie and Northern Horned Larks. This agrees with Dr. Stone's statement that "many subspecies . . . are as easy to identify in the field as are many species" (p. 37). But if, in either case, the bird in question produced some sound, the Flycatcher would be immediately identified beyond question, but the Larks could not be separated by that means.

If we find these two Flycatchers nesting on their breeding grounds, the

[1] Some Aspects of the Subspecies Question. Auk LII, pp. 31–39.
[2] Birds of the Northwest. p. 248.

habitat alone is sufficient to name them. If we find the nests and compare them as to materials and location, to say nothing of the eggs, we appreciate why these two birds are distinct species much more clearly than we could by examining skins. The degree of difference between them is really great.

In the vicinity of the Allegany School of Natural History, where I am now writing, four species of the genus *Hylocichla* are to be found in summer. It takes careful observation, under the best light conditions, to distinguish them by sight. But a mere hearing of a single call-note identifies each species unmistakably. The "pit-pit-pit" of the Wood Thrush, the "chuck" of the Hermit, the "whit" of the Olive-back and the "wheeoh" of the Veery are field characters that distinguish the species much more certainly than plumage and even more certainly than songs.

There are few subspecies, however, that the field student can distinguish with certainty. Their determination is best inferred from the range, or, when that cannot be done, they should be left undetermined. I record the Grackle on my spring lists in southern Connecticut, but seldom attempt to say which subspecies of Grackle I have seen till the migration is over and I know that the breeding birds are Purple Grackles. Here in Allegany State Park, New York, I do not yet know certainly whether the Song Sparrow is the Mississippi Song Sparrow or the Eastern Song Sparrow. Subspecies do not show differences in the field characters of the living bird.

The Northern and Southern Flickers are subspecies indistinguishable to the field student. The Northern and Red-shafted Flickers are distinguishable, but by color only. If a field student were sufficiently color-blind he would find them indistinguishable. Both species have the same habits and call-notes. Both call "kuleeup" in characteristic fashion. Both alternate their drumming with the long, loud "wick-wick-wick" repeated twenty to eighty or more times. In the mating season both, in company with mate or rivals, sidle around the limbs of trees, or bow to each other, calling "ooweeka, ooweeka." The nests of both are similar, and except that the species of trees are different because of geographical range, the habitats are essentially alike. Settlers in western Montana, who came to that region from various states in the Mississippi Valley, still call the bird "Yellow-hammer" and most of them seem never to have noticed the difference in coloration.

It is well known that along the border of the ranges of these Flickers, hybrids are commonly found. Or should I say intergrades? The degree of difference between them is greater than between the Northern and Southern Flickers, so they are considered to be species. To the museum ornithologist they are absolutely distinct. But in the field, where coloration cannot always be seen to advantage, they seem hardly more different than sub-

species. The relationship between them is certainly much closer than between the Flycatchers and Thrushes I have discussed. But there is nothing in our present methods of classification or nomenclature that indicates this difference in relationship.

In the genus *Dendroica* the various eastern species, occupying overlapping breeding ranges, are distinct not only in plumages, but in songs, nesting habits and other field characters. But, if we consider the Myrtle and Audubon's Warblers that are separated geographically, we find a case not unlike the Flickers. The two forms are different in coloration, but they call the same loud "tsick," have the same twittery sleigh-bell song, and breed in habitats that are essentially alike. To an eastern field observer, the first acquaintance with Audubon's Warbler gives him the impression of just a Myrtle Warbler with a yellow throat. Yet the arrangement of species in our 'Check-List' does not indicate the much closer relationship that the Myrtle Warbler has with Audubon's Warbler on one side, than with the Black-throated Blue Warbler on the other.

This same condition is also illustrated in the Juncos. I have no field acquaintance with the southwestern forms, but those that I do know, constituting seven forms and four species as recognized at present, *hyemalis*, *aikeni*, *mearnsi*, and *oreganus*, differ from each other in coloration only. Their calls, songs and nesting habits, so far as I have observed them, are all alike. I believe that their breeding ranges are all actually distinct geographically, though it might be difficult to realize this from reading the ranges given in the 'Check-List.'

Considering these facts it seems to me that we have been applying the term species to forms whose relationships within the genus are of two different sorts. First there are those forms that are distinct not only in coloration, but in field characters. They may or may not occupy overlapping breeding ranges, but they are so distinct that we need not use our judgment as to degree of difference. They rarely hybridize. Second there are those forms that differ only in coloration or measurements, and not in field characters. Their breeding ranges are always separated geographically, and wherever these ranges meet we find, or should expect to find, hybrids or intergrades, whichever we choose to call them. Among these forms are some we call species and some we call subspecies and nothing but our judgment as to degree of difference determines which word we should use for a given form. Our judgment is bound to differ individually. So long as we continue to use the same term (species) for some of these forms that we do for forms that are clearly distinct the matter will never be conclusively settled. In other words nature has established two distinct kinds of forms, geographical forms and fully established[1] forms. Our terms

[1] I do not mean to imply here that these forms are fixed and unchangeable.

"species" and "subspecies" do not comply with the natural condition but with an artificial, indefinite distinction based on our judgment of degree of difference with no uniform basis for such judgment. This has been brought about because we have made our studies of distinctions chiefly from dead birds and have neglected to consider the characters of living ones. It would be more logical to call all geographical forms subspecies and established forms species.

Such an action is probably too radical, at least for the present, but I believe the future will bring about some sort of recognition of these differences in what we call species, and some sort of treatment in our nomenclature or classification that will show the difference. The chief trouble lies in the fact that bird skins cannot preserve the field characters. In cases where we are not sure which group a particular form belongs to, we must rely on accurate, scientific field studies of songs, call-notes, habits, breeding habitats, etc., of two or more forms that are related. In this connection, if there still remains, in the minds of a few, the old-fashioned notion that the study of dead birds and skins is somehow higher and more scientific ornithology than study of the living bird, the way is being paved to eradicate it.

There is one point that may help to explain why we do not always find hybrids or intergrades when the geographical range would lead us to expect them. That is the fact that the breeding range of a species is not merely geographical, but also ecological. The White-winged Junco, for example, breeds in mountain ranges and hills that lie east of the main chain of the Rocky Mountains. It breeds only in forested areas. These mountains and hills are surrounded by open, grass-covered treeless plains, and are like islands in a prairie sea. The bird's breeding range is therefore separated from that of other Juncos by miles of open grass where no form of Junco breeds, and it is as much isolated as if it were a true island form.

The well known case of hybridizing in the genus *Vermivora* is of interest when we consider field characters. The Blue-winged and Golden-winged Warblers are distinct in plumage and in territory songs. They seem to be identical in call-notes, breeding habitat and nesting habits. The second song, used more commonly late in the breeding season, is also identical so far as my experience goes, but that experience is rather limited in the case of the Golden-winged Warbler. The two forms are therefore closer in relationship to each other than are any two eastern species of *Dendroica* for example. Perhaps they should be considered northern and southern geographical forms.

In considering these Warblers it is evident that differences in breeding habitat and nesting habits are more important in keeping related species apart than differences in plumage and song. If the territory theory is right, it is evidently the instinct of the male to select the breeding habitat, and of

the female to choose the nest site. These instincts are important characters in each species. There would seem to be no physical reason why a Chestnut-sided Warbler should not build its nest in a hemlock tree or a Blackburnian Warbler put its nest in a blackberry bush. That they do not is a matter of inherited habit, which, to my mind, is the best definition of what we call instinct.

The instinct to choose a habitat probably has more to do with the abundance of a particular species than any other factor. If a bird breeds in a variety of habitats, like the Robin, it is common. If its habitat covers a large area, like the Red-eyed Vireo, it is also common, but if the habitat is a restricted one, as in the case of the Worm-eating Warbler, it is comparatively rare or local in breeding distribution. If activities of man increase the area of its habitat, the species increases, as evidently has happened with the Chestnut-sided Warbler. If man changes or destroys large areas of its habitat it decreases or becomes more and more local, a fate that is gradually coming upon the Seaside and Sharp-tailed Sparrows, at least in Connecticut.

In considering the problem of the origin of species I believe this matter of habitat selection to be of importance. Much has been said in the past about the importance of isolation. Subspecies are generally considered to be the result of geographical isolation. Writers have also suggested physiological isolation due to differences in sex development. Neither of these seems very logical as an explanation of the existence of the species of such genera as *Dendroica, Hylocichla, Empidonax* and others. It seems likely that the ancestral species, that gave rise to such genera, ranged over a variety of breeding habitats, much as the Robin does today. Gradually, however, the descendants developed the habit of returning to the habitat where they first originated, and the instinct to select that particular kind of habitat developed. Groups of individuals became isolated from other groups of their kind by this difference in instinct, what we might call psychological isolation. Thus the condition, which it has been argued, is necessary for the beginning of a new species, the isolation of groups of individuals, would be brought about.

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# SANCTUARIES OF THE BIRD ISLANDS OF GREAT SALT LAKE.[1]

BY DR. JOHN W. SUGDEN.

GREAT SALT LAKE in the north-central part of Utah is the second largest body of water within the confines of the United States, being eclipsed only by Lake Michigan. It has the highest saline content of any other similar lake. At average level the specific gravity of the water is about 1.13 but this year, since the level has dropped below the lowest recorded mark, the specific gravity has a corresponding increase and now is about 1.2. It is essentially a saturated salt solution and the large square crystals of sodium chloride are being deposited on the sand of the bottom, on the hulls of the boats and on any foreign substance placed in the water.

Ecologically the waters of the lake constitute a physiological desert. No large animals and only a few small forms have been able to adapt themselves to the unusual environment and so far as known no parasites have been able to follow them into the brine. The flora is restricted to one of the blue-green algae (*Aphanothece utahensis*) a few unicellular green algae and a few diatomes. The former occurs in considerable amount and is the principle source of food supply. The most notable organism is the brine shrimp (*Artemia gracilis*) which passes its entire development to sexual maturity in the briny waters propagating parthenogenetically as well as by fertilized eggs. Two brine flies (*Ephydra hians* and *Ephydra gracilis*), have strictly aquatic eggs, larvae and pupae, the larvae having the breathing tube transformed into tracheal gills so that they need not come to the surface to breathe. The masses of floating pupae may be seen as brownish streaks in the water and when they collect along the shores great windrows, often many inches thick, are formed. They are used as food by birds, such as the migrating flocks of Northern Phalarope, the Eared Grebe, California Gull, certain Ducks and others. These extensive collections of fly pupae along the shores are mentioned in the writings of the early explorers and the Indians formerly collected them for food. The gnats, of course, are liberated on the surface of the water and collect in large swarms along the shore and for some distance inward and furnish food for some birds and the common spiders of the region.

The larger islands are arranged in two longitudinal groups. Fremont and Antelope Islands form an extension southward from the Promontory Ridge

[1] Read at the Fifty-second Meeting of the American Ornithologists' Union, October twenty-fourth, 1934, at Chicago, Illinois.

Dr. A. M. Woodbury, of the Department of Ornithology of the University of Utah, has allowed the author access to his files of correspondence and they have been used freely in the presentaton of this problem.

extending into the lake from the north. Stansbury and Carrington Islands are outposts of the Oquirrh range of mountains which extends along the western border of the Salt Lake Valley.

The bird rookeries are on the four smaller islands which furnish nesting sites for Pelicans, Cormorants, Herons and thousands of Gulls. In the order of their size they are Gunnison, Hat, Egg and White Rock Islands. In this discussion the following rookery birds are considered:

Double-crested Cormorant (*Phalacrocorax auritus auritus*), Treganza Blue Heron (*Ardea herodias treganzai*), American White Pelican (*Pelecanus erythrorhynchos*) and California Gull (*Larus californicus*).

Gunnison Island in the northern part of the lake has an area of about eighty acres and harbors breeding colonies of Gulls, Pelicans, and Herons. Because of its position it is the least accessable of the islands but even here the birds have been disturbed by marauding parties. Most boats depart from Saltair, a resort on the shores of the lake, and to reach the island necessitates a comparatively long water trip which because of the briny water and the frequent sudden storms might easily be dangerous.

To reach the island from the west, a long trip around the north end of the lake must be taken, over poor or non-existing roads and over part of the Great Salt Desert. This area extends westward as a great, flat, absolutely barren, glistening expanse of crystallized salt periodically flooded for miles when the wind blows from the east. There is no fresh water in this region.

Hat Island, so named by Capt. Stansbury because of its fanciful resemblance to the hats of that period, is now usually referred to as Bird Island. It has an area of about twenty-two acres and is used by Gulls, Pelicans and Herons during the nesting season. At one time a few Caspian Terns had nests along the sandy shore but they have long since deserted the island. The Gulls occupy most of the area and their nests may be found in every conceivable place; among the rocks, under the sage brush, beside the driftwood on the shore and at the top of the island. The nests are made of sticks, twigs, bones and feathers and because there is a limited supply of nesting material, competition among the birds is keen and the nests are considerably smaller than in other locations where there is an abundance. The usual complement of eggs is two or three.

After the Gulls have occupied their site, the Pelicans collect in nesting communities usually about the mid-portion of the island and place their nests in groups. The nest may be only a shallow depression in the ground among a scattering of sticks, bones, rocks, dirt and excrement, or if on a slope the lower portion is uaually built up so as to make the top of the nest level. Two, occasionally three and rarely more, eggs are laid in the nest. The Heron nests are usually on the eastern side of the island where the sage brush is larger. Sticks and twigs are piled into a living sage bush to construct a

platform which may be as high as four feet above the ground. Three or four of the large blue eggs are usually laid.

On Egg Island are found Gulls, Herons and Cormorants and this island has the distinction of being the type locality of Treganza's Blue Heron and the only island on the lake occupied by Cormorants. The island is merely a group of outlying rocks north of Antelope Island and is devoid of all vegetation. It is readily reached by boat or directly from Antelope Island by wading a short distance. Nests of the Cormorants and Herons are similar but the latter are usually larger. They are piles of sticks, bones, brush and mud. Those of the Cormorant are often liberally sprinkled with regurgitated fish, the decomposition of which gives a characteristic if not unusual stench. However, the rains and snows of winter, the hot sun and the brine effect a complete cleansing of the island by the following spring.

In a small lagoon off the northwest shore of Antelope Island is White Rock Island, a large rock with perpendicular sides rising abruptly out of the water. Because of the contour, it is difficult to effect a landing from a boat. Only the Gulls maintain a colony here but some years ago, possibly fifteen or twenty, there were also Herons.

The first descriptions of the birds of the islands and the marshes of the vicinity were made by the early explorers who were impressed by the untold myriads of waterfowl. Fremont visited the delta of the Bear River, September 3, 1843, and repeatedly describes the sound of the flying birds as "a noise like thunder." Capt. Stansbury in his exploration and survey of Great Salt Lake in 1849 to 1851 located and described the islands and was impressed with the numbers of Gulls, Pelicans, Herons and Cormorants. Apparently at that time Hat Island was not occupied as no mention is made of the birds in his journal.

The present cause for alarm is in the persistent and progressive decline in the numbers of these birds with the exception of the Gulls. The other three, the fish-eating birds, have reached the point in the reduction of their numbers when the minimal density is being exceeded and the extinction of the Herons and Cormorants in this location is seriously threatened. The Pelicans on Great Salt Lake have not fared as badly but their position is not secure, especially since the Government gives this bird no protection. They have been destroyed elsewhere and their numbers reduced as at Yellowstone Lake where they feed upon game fish. The total population in the United States has been decreasing and breeding colonies elsewhere abandoned so it may be the present population on the Great Salt Lake has been bolstered up by the remnants of colonies that have ceased.

There can be no doubt but that the Cormorants and Herons are decreasing. Behle has collected all the available data pertaining to this region and concludes that "the Double-crested Cormorants have decreased

alarmingly in numbers from 500 on Egg Island in 1915 to 100 in 1932. Treganza's Blue Herons have been reduced from 400 on Hat Island alone in 1915 to 96 on all the islands in 1932." Last year there were only two Heron nests on Hat Island and not over eighty young Cormorants were reared on Egg Island to the stage where they could take to the water and care for themselves.

The cause of the reduction in numbers is not due to the location. Breeding as they do on islands in the extremely salty lake they enjoy complete protection from all larger organism except man. There are no fish in Great Salt Lake but there is an abundant food supply in the marshes and sloughs at the mouths of the Jordan, Weber and Bear Rivers, the enclosures of the Bear River Refuge and Utah Lake farther to the south. This necessitates the birds flying thirty to one hundred miles from the breeding grounds to the source of food supply but their strong wings are adequate to carry them on their daily foraging expeditions. There have been no epidemics or sickness as has occurred among the western Ducks. Such other factors as increase in natural enemies has not been present and with the breeding range the same as before, the food supply and the feeding areas the same or even increased because of the recent addition of the ponds made by the diking at the Bear River Refuge, the only other seriously limiting factor is the persistent interference of man.

The California Gull has local public opinion in its favor since the summer of 1848 when it fed upon the swarms of mormon crickets (*Anabrus simplex*), that were destroying the first crops of the pioneers. Since then it has learned new feeding habits and regularly acts as a scavenger at the dump heaps, patrols the city streets for miscellaneous material, cleans up the noon-day lunch scraps from the school grounds and has even developed a method of picking cherries from the trees.

The Herons, Cormorants and Pelicans depend upon the fish from the streams and fresh water lakes. The Herons occasionally feed along some of the canyon streams and do obtain some trout and game fish and a few have learned that fish may be obtained at some of the fish hatcheries. This is certainly not the usual procedure and is only the habit of a few individuals.

Nevertheless, the fish-eating propensities of these birds have aroused the enmity of certain fishermen, hunters and so-called sportsmen of the state, who have persistently waged destruction at every opportunity and their work has often been with the knowledge of the fish and game department. The movement has even been encouraged by the furnishing of ammunition for the hunters.

A rookery of Treganza's Herons in a grove of cottonwood trees on the west shore of Utah Lake was totally destroyed a few years ago under such

encouragement. The adults and young were ruthlessly killed and the fledglings left to starve in the nests. The abandoned nests in the trees now stand as the result of the complete extermination of this colony. Other colonies have chosen the rushes about the sloughs and lakes. On several occasions those on Utah Lake have been fired during the breeding season and when visited the half cooked eggs and dead young were found in the burned nests. Not only the Herons but Egrets, Ducks and other marsh birds have suffered by this unwonted destructive procedure. Similar raids by Idaho sportsmen have been made upon the colony of Cormorants at Bear Lake a few years ago, resulting in a large destruction of the eggs and young. Any bird that eats fish is the subject of persecution. On Utah Lake, the small colony of Caspian Terns, the only one in the state, has been raided, all the eggs gathered up and broken against the rocks. Every isolated Heron, standing quietly at the edge of a slough, waiting to catch a frog, a fish or other food is shot at by hunters and fishermen at every opportunity.

Few, if any, birds, especially if gregarious, can withstand repeated molestation and destructive raids during their breeding season, the most vulnerable period in the life of the species. The colony of Cormorants on Egg Island is the only one on Great Salt Lake and probably the only one in the state and last year it was able to produce less than one hundred young to hazard the dangers of the first migration.

Another detrimental factor is the frequent visits of large parties of picnickers such as the one last year that was marooned on Hat Island. On these occasions the Pelicans immediately desert the nests leaving the young and eggs to the devastating effect of the hot sun and the rapacious appetites of the Gulls.

The evidence against these birds has been based upon insufficient facts and faulty reasoning and the hasty conclusion that the fish-eating birds are the cause of the decreasing supply of game fish is entirely erroneous. Other factors as over fishing, stream polution, illegal methods of fishing, diversion of water, etc., are rarely considered. Behle has conclusively shown, based on stomach analyses and the examination of regurgitated material of adults and young, that these birds are utilizing the slow-moving, non-game fish such as carp, chubs and suckers and that only occasionally can the remains of trout or bass be found. They are thus of distinct economic value by tending to limit the herbivorous carp that eats out the plant food supply and pollutes the water, making it impossible for game fish to live. The carp, especially, has multiplied up to the limit of food supply and as such is competing with Ducks and other game birds for the water plants so necessary for Duck food. Hull considers the Pelicans a great asset in controlling the ravages of the fish in the ponds at the Bear River Game

Refuge. The problem at the Yellowstone is not analogous. There the only fish concerned are trout. It has been shown at Pyramid Lake, Nevada, that as the fish-eating birds decreased, the game fish also decreased. The intermediate factors must be considered in the problem of food chains. Reduction at the top of the chain disturbs the balance and does not necessarily cause an increase at the far end. The intermediate organisms may assume alarming proportions.

A further factor should also be seriously considered. The aesthetic value of large numbers of these characteristic big birds as attractions for recreational, educational, and tourist study cannot be overlooked. The variety and numbers of wild life undoubtedly is a major attraction of the Yellowstone. The bird refuges of the lower reaches of the Mississippi River are already widely known and are attracting visitors. It is possible that these attractive birds as a source of revenue alone, may outweigh the value of the few game fish that they consume. The Bear River Wild Fowl Refuge will be an attraction not only for the propagation of Ducks and Geese but because of the large numbers of other birds that can easily be seen in their natural surroundings. One hundred and eighty-three species have already been listed as occurring on the refuge and fifty different birds might easily be observed in one morning.

It is difficult to get those that formulate the plans and policies of wild life administration to consider much except the exploitation of game or the propagation of species to be used as game. Steps have been taken to bring these islands under Federal control and Hat Island was actually designated as a bird refuge until a revocation of the order was passed May 12, 1930, when it was learned that the island had been patented as a mineral claim because of the guano deposits. These deposits have proved valueless due to the difficulty of their removal and the small amount, most of the accumulation of the summer being washed away during the winter. The same is true of Gunnison Island. Apparently White Rock and Egg Island have never been surveyed. The present owners have raised little objection to the proposition because they have been unable to gather any revenue from their possessions.

The Biological Survey has been repeatedly advised of the condition and has expressed its interest. The proposal along with others has been presented to the President's Committee on Wild Life Restoration by being included in the recommendations recently submitted through the Fish and Game Commission but as yet, no action has been taken. It was hoped that in their proposed setup these islands might be included as breeding grounds of migratory birds on marginal lands of low value. The wheels of the machinery may move too slowly.

The suggestion of making the islands State Refuges could hardly be

considered. It seems inadvisable to entrust the protection to those primarily concerned with game exploitation particularly since, in the past, they have had the opportunity of applying conservative measures but have only expressed passive approval and veiled promises.

Various other agencies are sympathetic with the program and have assured their support. Public backing of a program to establish sanctuaries on the bird rookery islands seems assured. The private holdings are essentially valueless and there should be little difficulty in acquiring them under a federal plan, where they could easily be administered under national control, possibly as a part of the Bear River Project.

In conclusion, may this thought be repeated. The bird islands of Great Salt Lake harboring rookeries of White Pelican, Treganza's Blue Heron, Double-crested Cormorant and California Gull have, with the exception of the Gulls, had a progressive decline in their population, too long continued and too steady to be of a cyclic character so that at present the actual extinction of these birds in this location seems imminent. They have a distinct aesthetic value and economically their beneficial habits outweigh any destructive traits. With the decline of birds in other regions and the necessity for control of numbers, in instances where the conditions warrant it, these islands might be able to maintain a breeding population to preserve the race. It is earnestly recommended that these islands be brought under Federal management as breeding sites of migratory birds.

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# OBSERVATIONS ON THE SPOT-BACKED WEAVER, (*PLOCEUS SPILONOTUS* VIG.)

BY RAYMOND B. COWLES.

THROUGHOUT the areas in South Africa included in Natal and parts of Zululand and Pondoland, this Weaver, known by the Zulus as iHlokohloko, is probably the most abundant species of the Ploceids.

Unlike many of the other species of Weavers, this bird is exceedingly adaptable and therefore has a rather wide distribution and occurs in several types of environment. Its main requirement aside from food and water is the presence of trees suitable for shelter and nest building. The birds nest in loose colonies, selecting one or more trees growing fairly close together and hang their nests on long slender twigs. They particularly favor the introduced bamboos, and eucalyptus trees, often establishing large colonies which may overflow from the original site to several other trees. A colony of these birds is in a constant state of activity, singing, nest building, and courtship, with the accompanying noise. Flocks leave and return throughout the day and occasional sharp panics produce an absolute though ephemeral silence, which is quite startling in comparison to the usual bustle and rush. The sudden periods of quiet are similar in effect to the sudden cessation of croaking in a pond of frogs or tree-toads, loud noisy calling on all sides, then sudden quiet, broken at first by a few adventurous individuals making tentative trials and leading the entire flock back to its noise once more.

The flocks feed on the ground, eating sprouting grain or even fairly hard newly planted seed, and probably insects also. They are also competitors of domestic fowls for their food, and often gather in large numbers around pig-pens where they feed on bits of scattered food. From such rather sordid surroundings they will dash off to visit an Erythrina, uHluzi, Eucalyptus, Gravillia, or other nectar bearing flowering tree and gorge on the abundant food available in such places. They are more prominent as nectar feeders than any other species except the Sunbirds. Individuals are frequently collected with their heads well dusted and feathers somewhat glued together with pollen and nectar. Undoubtedly they are a factor in pollination of certain plants.

The individual songs are rather attractive. The first notes coming in easy runs are rather musical, but the last note or notes are squeaky, gasping sounds as though wrung out to the last "bitter end."

One colony was observed carefully; the observations extending from the first visit of the flock to the nesting tree, a large Acacia partially overhanging a river, until after completion of nest building when a pair of

Little Sparrow Hawks raided them persistently and drove them away. Unfortunately it is impossible to give a complete account of their life history, owing to the fact that these Hawks terminated the activities in the colony prematurely, but an account up to the time of nest desertion may prove of interest.

After several casual visits to the tree, nest building commenced on September 18, and progressed steadily for several days. At first there were only a few birds, not more than eight or ten in the flock, but the activities seemed to attract other individuals who soon added their nests to those which had been started first, so that by October 9 there were twenty-five nests in the one tree.

A nest starts as a loosely woven ring about the size of its final smallest diameter. Several strands of the building material are tightly fastened to the supporting branch in such a position as to bring the transverse plane of the finished nest along the same axis as the twig to which it is attached. When the strands composing the circle have been built into a diameter of about an inch, the rest of the nest is added. This original circle forms the dividing point between the very short neck and the pocket. The rest of the material is woven to this early framework, strand by strand. The weaving is done by poking one end of a strip of material, over and under and over and under, then the strip is grasped and pulled tight, and pushed over and under, etc., until the entire strand has been woven into place. The process is essentially the same as any weaving except that a piece may pass under either several or only one other strand at different points, and thus makes an uneven finish. The bill is used as a pair of forceps and is an excellent tool.

The nesting material was obtained from the blades of reeds growing along the river (*Phragmites communis*). The blades were split into strips from an eighth to a quarter of an inch wide and from a few inches to a foot or so in length.

When the nest is partly completed the male hangs to the lower edge of the opening and with fluttering wings and loud calls moves or shakes the nest, rotating it from side to side violently, meanwhile looking alertly in all directions. Within a minute or two a female will fly up to the nest, give it a thorough inspection and depart again, for they take no part in the construction work, at least until after all the externals have been completed.

All the leaves on the twig to which the nest is attached, and usually those on nearby twigs also, are removed, clipped off at the base. A tuft of leaves is often left at the fastening point of the nest and tip just beyond this point. A few are usually worked into the nest itself and show as living green after the strands of the nest material have become dry and brown.

It is interesting to speculate as to the reasons for this clipping off the living leaves. The nests are thus exposed in plain view as large lumps

attached to the ends of slender twigs. The most obvious but possibly not the correct answer would be that it is a protection from marauding terrestrial and arboreal enemies that are unable to fly and must trust their weight to the nest support. Bare twigs would appear dead and therefore dangerous. The living leaves at the nest remain as guarantees to the owners of the nest that their support is still living and has not died and weakened. These suppositions may be close to the truth or it may be that the habit is simply a nervous demonstration. In any case the general effect is that of a large group of nests attached to dead twigs, but any animal habitually preying on the birds might be expected to sense that the green leaves in the nest indicated safety, and eschew those not so decorated.

The violent shaking of the nest by the male during courtship is a practical demonstration that the nest is firmly attached to a staunch twig and will not fall off, but ordinarily the ground under a large colony is littered with a good many nests that have proved faulty and in spite of a safe appearance have fallen to earth, almost always carrying a part of the twig with them.

About the middle of October the little Hawks previously mentioned, put in their appearance and from that time the numbers of birds at the tree steadily diminished, probably due to continual harrying. By October 23 the tree was practically deserted. There is no way of knowing the exact relationship between the Hawks and numbers of birds killed or the effect of the harrying, but it is possible that the presence of a thriving colony of Weavers a mile away may have aided the desertion of a dangerous and therefore unsatisfactory site. It is certainly true that a colony, although started by one flock receives accessions from other groups.

After the breeding season is over, the site is deserted but from time to time one may find smaller colonies building a few nests which are usually deserted without ever being completed. One such colony was watched for a time early in March. None of the nests was completed, i.e., lined, and the entire proceeding seemed to be merely an expenditure of surplus sporadic post-seasonal courtship energy. The natives maintain that such nests are built as sleeping quarters. The theory was not investigated.

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# A MODERN LA BREA TAR PIT.

BY A. E. BORELL.[1]

ON SEPTEMBER 26, 1934, my attention was called to a tar pit in which a number of birds had been trapped. The pit was located one mile southwest of the village of Grand Canyon, on the south rim of Grand Canyon, Coconino County, Arizona, and had been placed there during the building of the Hermit Rim Road. There proved to be one main pit about twenty feet in diameter and four smaller ones formed by seeps from the main pool.

At first sight there seemed to be only a few birds in the tar but closer observation showed many more. Some had disappeared completely, leaving only the outline of the bird on the surface. Bodies were in all stages of decomposition from skeletons to those recently dead.

On September 26, I counted 123 individuals and was able to identify 13 species as follows:

Rocky Mountain Grosbeak (*Hedymeles melanocephala papaga*), 1.
Mexican Crossbill (*Loxia curvirostra stricklandi*), 18.
Band-tailed Pigeon (*Columbia f. fasciata*), 1.
Cooper's Hawk (*Accipiter cooperi*), 1.
Chestnut-backed Bluebird (*Sialia mexicana bairdi*), 2.
Lewis' Woodpecker (*Asyndesmus lewis*), 9.
Natalie's Sapsucker (*Sphyrapicus varius nataliae*), 4.
White-breasted Woodpecker (*Dryobates villosus leucothorectis*), 1.
Western Chipping Sparrow (*Spizella passerina arizonae*), 3.
Green-tailed Towhee (*Oberholseria chlorura*), 1.
Western Vesper Sparrow (*Pooecetes graminens confinis*), 2.
Gambel's Sparrow (*Zonotrichia leucophrys gambeli*), 2.
Long-crested Jay (*Cyanocitta stellata diademata*), 1.
Large Hawks, 5.
Jays and Woodpeckers (unidentified), 7
Small birds (unidentified), 65

Immediately steps were taken to have the pit covered with earth and several truck loads were hauled. However, the large pit proved to be deeper than expected and the fresh oil from beneath soon came to the surface and oozed out beneath the earth covering. On October 26, I again visited the pits and found eight new birds as follows:

Western Evening Grosbeak, (*Hesperiphona vespertina brooks;*) 4.
Northern Pine Siskin (*Spinus p. pinus*), 3.
Cassin's Purple Finch (*Carpodacus cassini*), 1.

[1] Associate Naturalist Technician Wildlife Division, National Park Service.

On learning that the pits were still deadly, many more truck loads of dirt were hauled and piled on and around them. It was then thought that our troubles were over. However, on April 2, 1935, I found that tar was again beginning to seep out beneath the cap of earth, and more dirt had to be supplied.

This brought out two points. First, that tar remains sticky enough to trap birds even during comparatively cold weather. Second, that such a tar pit demands repeated treatments in order to cover up the tar which continues to seep out.

Although the oil-soaked birds presented a pitiful sight, they were interesting from several standpoints. In most cases birds of one species were grouped in very small areas, apparently all having been trapped at approximately the same time. Eight of the nine Lewis' Woodpeckers were within a radius of three feet. Four of these had their heads resting on floating boards, suggesting that the birds had made a dying effort to keep their heads above the tar. Most of the Crossbills were in three distinct groups, several of the birds touching each other. This apparently indicates that when one bird was caught, others of the same species flew down to it, either out of curiosity or thinking that the first bird had found water or food.

One species found in the tar proved to be comparatively rare. Previously the Lewis' Woodpecker has been recorded only twice from the South Rim.

The Hawks probably were caught while endeavoring to capture the fluttering birds or in trying to feed on the dead ones.

One spotted night snake (first record for the South Rim) and several dragon flies, butterflies, and other insects were also victims of the tar. Possibly some of the birds were trapped while trying to recover the insects. My observations led me to believe that birds are engulfed rapidly when caught during warm weather when the tar is fluid.

Mr. Jack Tooker, who has been in the region for many years, said that several years ago he helped pull deer and cattle out of this pit.

This article is written primarily to call attention to a type of conservation that can be done by people interested in birds. Crude oil is sometimes permitted to stand along oiled roads, about oil wells or refineries, along railroads or around city dumps. Often this is merely waste oil. If everyone interested in wildlife were to keep this in mind and investigate places where tar pits are likely to occur, I believe that many death traps and potential traps would be found.

As mentioned above, it is not always easy to eliminate a tar pit. However, I believe that usually enough pressure could be brought to force the owner, or agency responsible, to correct the condition. Burning is the simplest where this is possible, otherwise the tar can be covered with earth, or a screen or board covering made for the pit. Where earth is used, it will

be necessary to inspect the pit occasionally to cover any oil which may be seeping out. Even small seeps are dangerous as fresh oil need be only a fraction of an inch thick in order to trap and hold small birds.

In the warmer climates, tar may be fluid enough to be dangerous for eight or nine months out of the year. Since 123 birds were found at one time in the pit described above and eight more a month later, we can appreciate the great numbers which may be destroyed during a period of several years or even during a single year.

*Grand Canyon National Park,*
*Arizona.*

# THE FOOD AND NESTING HABITS OF THE BALD EAGLE

BY FRANK R. SMITH

WHEN in June, 1782, the Bald Eagle (*Haliaeetus leucocephalus*) was chosen for our national emblem, the bird was fairly common throughout most of the United States where conditions were suitable. Since then it has been exterminated over most of its original range and is found today only where law or seclusion give it protection.

It has been my fortune to observe the Eagle in one of these remaining strongholds and to study its food habits at two nests. One of these nests which it was possible to examine carefully yielded much interesting information about the food and habits of the Eagle in this type of environment.

The location of the nests was the Eastern Shore of Maryland, which with two counties of Virginia and the state of Delaware, constitutes the peninsula of land which cuts Chesapeake Bay off from the Atlantic Ocean.

The land in the area where the nests were located is very low and much of it consists of marsh and swamp land. It is drained by Blackwater River, a sluggish stream, fresh at its head but brackish and nearly salt at its mouth. The river flows through the great Blackwater Marshes which are dotted with ponds and small pine-clad elevations known as islands. Along the borders of the marsh are growths of trees which in some places extend back for several miles. These areas are flooded at every heavy rain and during the winter months, and are known as swamps. The chief trees in these swamps are loblolly pine, sweet gum, holly, and white and willow oaks. The one in which the first Eagles' nest was located is known as Gum Swamp.

The Blackwater marshes are famous for their muskrat population and for the great number of water-fowl that winter in the ponds and on the river. The river also has an abundance of fish. The old Eagles evidently had an eye on these bounties of nature when they established their lofty eyrie at the edge of the marsh so long ago.

The nest was located some two hundred yards from the open marsh and less than a mile from Blackwater River. It was about seven miles to the waters of Chesapeake Bay and less than three quarters of a mile to the nearest house. The original nest had been located for no one knows how long in a big pine far back in the swamp. Some thirty years ago the tree was cut and the Eagles then moved to the giant pine near the edge of the marsh. Here for over thirty years their nest was located until the hurricane of August 22, 1933, came sweeping across the marsh and tore the great nest from its place. The nest was not in use when destroyed, in fact no attempt had been made to rear a brood there for three years. A local egg collector had paid it yearly visits until the Eagles ceased to breed there. They still

guarded the tree, however, for in 1933 they routed a pair of Ospreys that attempted to nest on top of the old nest.

The remains of the nest were carefully sifted by hand and placed in baskets for weighing. All food remains were carefully saved. For this work Mr. Peter J. Van Huizen, acting supervisor of Blackwater Migratory Bird Refuge, gave able assistance. The forty-three bushels of material in the nest weighed 1274 pounds. A considerable number of the large foundation sticks remained in the tree and the food remains were not weighed. If these items had been added the weight of the nest would have been well over thirteen hundred pounds. The material was wet when weighed and this of course increased its weight. It was no wetter, however, than it must necessarily have been during every storm. Due to the bulk of the nest and the great water-holding capacity of its material, it is doubtful if it was ever completely dry even during the heat of summer. It must be recalled that the nest had not been occupied by the Eagles for three years and that the small amount of material added by the Ospreys would be practically negligible. Anyone familiar with the subject will recall the rapid disintegration of large nests. Decay must have removed several hundred pounds of the nest during the three years of abandonment preceding its fall. When the nest was in use and in good repair it must have weighed nearly a ton. From observations made from the ground it appeared that the nest was over ten feet thick and from four to five feet across.

The material of the nest consisted largely of dark brown mold held together and reinforced with sticks of pine and oak. Scattered through the mold were stalks and roots of cat-tails, grass and sedges as well as numerous pine cones and acorns.

As has been said, the food remains found were all carefully saved for identification. Due to lack of experience the remains of water-fowl could not be classified to species, several of which were probably represented. Some of the bones were so fresh that they were still held together by the ligaments while others were so badly decayed that they must have dated from almost the beginning of the great nest. Examination revealed the remains of the following animals in the nest. Muskrat 35; Water-fowl 8, of assorted kinds; Fish several; Periwinkle 1; Spotted Turtle 1; Blue Crab 1: and part of what appeared to be the skull of a Red-tailed Hawk.

From this list it will be seen that the Eagle depended for food almost entirely on the marsh. The Hawk was the only victim not directly connected with the water.

The capture of muskrats constitutes the greatest cause of complaint against the Eagle in the Blackwater district. A great many of the people make a living by the trapping of this fur bearer and the depredations of the Eagle are regarded as a serious offense. This is augmented by the

Eagles occasionally devouring the muskrats caught in the traps or by carrying off both these animals and the traps. The discovery of three traps in the nest, each holding between rusty jaws the leg bones of a muskrat, offered ample proof of this last habit. Although thirty-five skulls were found in the nest, it must be remembered that this amounts to only about one muskrat a year. These food remains, however, would at best represent only a very mall part of the total food brought to the nest.

Eagles, like Vultures and most other birds of prey, often eat dead muskrats found on the marsh. I have seen an immature Eagle drive a Vulture from a dead muskrat and eat the animal himself. It is probable that half of the muskrats eaten by Eagles are picked up dead on the marsh. This is a commendable habit for it removes the bodies of animals dead of disease and thus tends to lessen danger of an epizootic among the animals. Of course it could not be determined how many of the skulls found in the nest represented animals picked up dead on the marsh. Hunters denounce the Eagle as a killer of Ducks and Geese and the remains of eight water-fowl in the nest sustained this accusation. It has been claimed by friends of the Eagle that they seldom attack Ducks unless they are sick or otherwise partly disabled. It is almost certain that the Eagle will attack these birds if they are available in preference to an able bodied Duck. Failing to find this disabled prey they probably attack any other fowl at hand. The destruction of crippled Ducks could hardly be held against the Eagle. Hunters wound a great many Ducks which they never recover. These maimed birds are left to wander about over the marsh as best they can until death from their wounds, starvation, or predators ends their pain. Sportsmen often kill more Ducks than they can use and these together with any that may be too badly shot up are left on the marsh. One of the sterna from the nest showed two shot holes, either of which would have been fatal. This bird had doubtless been picked up dead on the marsh where it had been left by hunters. It is hard to tell how many of the others had been similarly salvaged.

Eagles are fond of fish and the bones in the nest indicated that these vertebrates had frequently been served. It has been said that the Eagle secures most of its fish from the Osprey. Although both Ospreys and Eagles were often seen, the former frequently with fish, I never saw either species pay any attention to the other. Apparently the Eagles on the Blackwater marshes have not learned the trick or have found it easier to secure food otherwise. I have seen two adult Eagles together with a flock of Gulls feasting on the refuse from a fish cannery at Taylor's Island.

The periwinkle shell was probably carried to the nest in building material. They are fairly common on the saltier portions of the marsh. The shell was not broken and it would have been impossible for the Eagle to extract

the snail without breaking the shell. The blue crab shell may have also come to the nest with building material but I am inclined to believe that it was brought for food. These crustacians are favorite food for almost all the flesh-eaters on the marsh and there is no reason to believe that the Eagle would not eat them also.

The fragment of what appeared to be the skull of a Red-tailed Hawk is not difficult to explain. There is no reason to believe that an Eagle would spare the Hawk because of their close relationship. Both birds are often found on the marsh in search of the same prey and a Hawk would offer a meal equal in size to a Duck. The colored people and some of the whites in the Blackwater region regularly eat both Hawks and Eagles and declare them equal in flavor to Ducks. There is no reason to suppose that the Eagle would not kill and eat the Hawk, something which its strength and speed would enable it to do with ease.

The second nest examined was located in a district known as Meekin's Neck. Mr. Harry Wallace, my trusty old assistant, helped with this examination. The tree had died and been cut two years before so that the nest was badly scattered. The nest had been very large but no one could tell me how old it was. The tree, which was of immense size, was over 175 years old and the nest had been located over one hundred feet above the ground. This nest was less than fifteen miles from the other and within half a mile of Chesapeake Bay. As would have been expected with the bay so near the Eagle had depended largely on water life for food. Water-fowl came in for a good share of attention with seven sterna and a few other assorted bones. Fish also were well represented with twenty-two head stones and some bones. There were seven pieces of oyster shells, half the shell of a small salt-water mussel, and a periwinkle shell. It is hard to believe that an Eagle could or would eat such shellfish. It seems probable that the oyster shells were brought to the nest attached to sticks which had been submerged, and that the other items were brought in other building material. A part of the lower jaw of a muskrat was also found as well as a small part of the skull of what might have been a mink. Numerous pieces of egg shell in various stages of decay probably represented the remains of the Eagle's own eggs over a period of years. Miscellaneous items included two furnace clinkers, probably carried there with drift from the bay used in nest building; a few small gravels, probably from water-fowl; and parts of three long copper-jacketed bullets, probably fired into the nest by some hunter.

Eagles are often blamed for carrying off lambs but these accusations are seldom well founded on facts. If true it is usually a crime of the individual Eagle rather than the species as a whole. Mr. Wallace told me that about forty years ago he saw an Eagle flying over a field where some sheep and

lambs were feeding. At first the Eagle was high up but it dropped down to some twenty feet above the ground where it made several circles. One lamb was lying down a little removed from the others and it was this animal that seemed to attract the bird. Suddenly the big bird made a swoop and without checking its flight or pausing for an instant, seized the lamb and continued its flight toward the woods. Mr. Wallace said that it had been many years since he had known them to carry off a lamb.

The incident of the lamb recalls a story, widely current in the Blackwater region. This story was related to me by several of the older residents but no one could vouch for its truth. Many years ago an Eagle caught a lamb on Hog Island and flew across Chesapeake Bay with it to a spot at the mouth of the Patuxent River. If this story be true, it gives a good example of the Eagle's strength for the Bay at this point is over ten miles wide.

*Fredericktown, Pennsylvania.*

# THE REDISCOVERY OF THE NUTHATCH *DAPHOENOSITTA* WITH NOTES ON ITS AFFINITIES.[1]

BY A. L. RAND.

THE rediscovery of the rare pink and black Nuthatch (*Daphoenositta*) was one of the most interesting ornithological results of the American Museum's 1933 Papuan Expedition.[2]

But seven specimens of *Daphoenositta* were in existence, and none of these was in America, up until the time our collections were made, so that the finding of this bird added considerably to the interest of our mountain work.

The species was first discovered by Signor Giulianetti, collecting for Sir William MacGregor during October 1–5, 1896, on Mt. Scratchley, Wharton Range, in southeast New Guinea, at an altitude of 3750 meters. He collected three skins of females and a spirit specimen, and recorded the stomach contents as insects.

The distinctiveness of the bird and its relation to *Neositta* were recognized by DeVis who described it as a new genus and species, *Daphoenositta miranda.*[3]

Salvadori examined one of these specimens in 1898 and discussed the species in 'The Ibis' for that year. The species was figured at the same time.[4]

The species was next found by Mr. Lorentz who collected three males in the Hellwig Mountains (eastern Snow Mountains) in October 1909. These were referred to a new subspecies, *frontalis*, by Van Oort.[5]

This is all that was known about this aberrant Nuthatch.

In the course of our explorations we collected *Daphoenositta* only on Mt. Tafa, a subsidiary mountain of the Wharton Range, about forty kilometers west of Mt. Scratchley where Giulianetti discovered it forty years before.

We camped on the east slope of Mt. Tafa at about 2000 meters altitude for most of May 1933. This was in the tall, dense subtropical forest. Here we encountered *Daphoenositta* only twice. On May 21 I found a party of about eight birds feeding amongst the smaller limbs in the top of a tall forest tree, and on May 28 Mr. Archbold found another party in a similar situation.

The next two months were spent on the Wharton Range at 3680 meters altitude on Mt. Albert Edward, where no *Daphoenositta* was seen, and in

[1] Published by permission of The American Museum of Natural History.

[2] This expedition, sponsored and led by Mr. Richard Archbold, had for its object the study of the flora and vertebrate fauna of the higher altitudes in southeast New Guinea.

[3] 1897, Ibis, p. 380.

[4] 1898, Ibis, pp. 208, 209, pl. IV.

[5] 1910, Notes Leiden Museum, XXXII, p. 214.

Murray Pass, at 2800 meters, where I saw a party of small birds I took to be this species but it was so difficult to move about in the trailing-bamboo draped forest that I was unable to secure a specimen.

Returning to Mt. Tafa at the end of August we camped at about 2400 meters, where the tall forest of the Subtropical Zone changed to the mossier forest of the Temperate Zone. Here we found *Daphoenositta* fairly common.

On August 27 a flock of about ten of these Nuthatches came into the trees about the camp clearing. They were not in the tree tops this time but low amongst the smaller limbs and even on the trunks of the trees within five meters of the ground. They were behaving rather in the manner of Nuthatches, hopping along the smaller branches, head upwards or head downwards, and also up and around the trunks of the trees, clinging to the bark. As I noted on other occasions also, each member of the flock kept uttering little short calls so that the result recalled that produced by a flock of Finches. The birds were not at all shy, though quick and active in their movements, and I was able to collect seven before the flock left.

During the next few days I saw several flocks of this species in the tree tops but due to the difficulty of moving about on the steep wooded slopes I was unable to get near them before they moved away through the forest.

On August 31 I found a party of about ten close to the trail, moving about in the smaller limbs in the top of the tree. The birds were shy and the flock kept moving about so I was able to secure but one before the rest disappeared. I saw another flock on September 1 moving quickly about in the tops of the tallest tree; two days later Mr. Brass, the botanist of our party, secured one bird from a flock and the next day a shooting boy brought in one he had collected from a flock. This was the last we saw.

This bird, rare in collections, appears to be fairly common in its mountain habitat at about 2400 meters, and to range from 2000 to 3750 meters; thus it is a bird of the Subtropical and Temperate Zones.

The parties of six to ten in number, keep together and move about quickly through the forest. They are usually in the smaller branches of the tree tops, but occasionally come down into the lower branches and even on to the tree trunks; they creep about the branches searching for their food in a fashion which recalls the Red-breasted Nuthatch (*Sitta canadensis*). Their food is evidently largely insect matter as several stomachs examined contained insects, including two caterpillars; and one contained a spider.

These parties of Nuthatches never were accompanied by other species. The flocks contained birds of both sexes; in one flock were birds with enlarged gonads, adult birds showing no enlargement of their gonads, and birds in immature plumage with skulls incompletely ossified.

On Mt. Tafa there seemed to be a general breeding season for most birds beginning about October, but *Daphoenositta* appeared not to conform to

this; males taken in May as well as one in August had enlarged gonads; three August females had somewhat enlarged ovaries.

Color of soft parts: adult male iris dark brown, bill black, feet dark olive brown; adult female iris yellow, bill black, feet yellow, nails gray; immature male (molting out of nestling plumage) iris grayish brown, bill black, feet horn color, tinged olive; immature female (largely in nestling plumage) iris pale yellow, bill grayish black, base of mandible gray, gape yellow, feet grayish yellow, nails gray.

The measurements of our series in mm. are as follows:

| | *Male Ad.* | | | | *Male Imm.* | | | *Female Ad.* | | | | *Female Imm.* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wing | 84 | 86 | 86 | 87 | 79 | 82 | 82 | 81 | 84 | 85 | 87 | 82 |
| Tail | 42.5 | 42 | 43 | 42.5 | 41.5 | 41 | — | 39 | 40.5 | 41.5 | 43 | 41 |
| Culmen | 11 | 13 | 12 | 12 | 12 | 12.5 | — | 12 | 11 | 11 | 12 | 11 |
| Tarsus | 18 | 20 | 18 | 18 | 17.5 | 17.5 | 13 | 18 | 18 | 17 | 19 | — |

One specimen, a female taken August 27, is in nearly full nestling plumage, just starting to molt into the first year dress. The forehead is cinnamon, the rest of the upper parts are dusky black with cinnamon tips to the feathers, except for the more silky rump feathers which are gray tipped dark rufous. Chin and upper throat are light cinnamon; breast feathers are grayish black tipped cinnamon, the lower breast and abdomen gray, the feathers tipped with pale cinnamon. The wing is black like the adult wing but the upper coverts and tertials are tipped cinnamon. The tail is similar to that of the adult but the pink areas are less intensely colored Two immature males are molting into first year plumage and two are in complete first year plumage.

The first year plumage is acquired by an incomplete molt, the rectrices, remiges and some of the upper wing-coverts being retained. This first year plumage resembles that of the adult except for being slightly less intensely colored. Male and female are alike in plumage and size but are easily distinguished by the color of the soft parts.

The genus *Daphoenositta* is very well marked. It differs from *Neositta* in the straight, not upcurved, culmen, the uncination and notch more pronounced, the basal widening of the bill greater, the nostrils having a more developed operculum, the almost complete lack of nasal, rictal, and interramal bristles. The tarsus is much longer than the bill and slightly longer than the middle toe with claw, the scutulations on the front of the tarsus are less distinct than in *Neositta*. The tail equals about one-half the wing length and the tail is quite rounded. The texture of the plumage of *Daphoenositta* is a further development along the lines of *Neositta* away from *Sitta*. The terminal fourth of the feather is of firmer, more compact structure than the basal portion and the narrow edgings to the feathers are grayish and

slightly iridescent, giving a scaled appearance. (However, *Callisitta* also has a firmer feather structure than *Sitta*.) The difference in color pattern is mentioned below.

The genus *Daphoenositta* contains but a single species, *miranda*, with the typical subspecies in southeast New Guinea; and the subspecies *frontalis* distinguished by the greater extent of red on the forepart of the head according to the descriptions, in the Hellwig Mts. (eastern Snow Mountains near the head of the Noord River).

*Daphoenositta*[1] is an aberrant Nuthatch which is probably best included with *Neositta* in a separate subfamily. *Neositta* has been considered as forming the subfamily Neosittinae, but as *Daphoenositta* is the oldest genus, the subfamily must be called Daphoenosittinae.

This subfamily is characterized by the laterally compressed bill (nearly approaching the condition of a ridged culmen) with a slight (*Neositta*) or a pronounced (*Daphoenositta*) basal expansion, exposed, linear, strongly operculate nostrils, the uncinate and notched maxilla (DeVis, l. c., described the bill as not notched), the absence or very slight development of nasal, rictal, and interramal bristles, the long wing with the second primary about equal the fifth. The outer toe is relatively longer than in the Sittinae; without its claw it reaches beyond the last joint of the middle toe.

In color pattern both *Neositta* and *Daphoenositta* differ greatly from typical Nuthatches, *Neositta* being gray, streaked with dusky or brown above, the lower rump and upper tail-coverts white, the crown black, gray, or white, below white with or without streaks. *Daphoenositta* has the body plumage generally blackish, with red about the bill and an indication of a red rump; both have a light (white or rufous) band across the middle of the under side of the wing. The coloration of the spotted young, differing from the adults, also contrasts with *Sitta*.

*Neositta* makes an exposed nest in the fork of a branch; the nidification of *Daphoenositta* is unknown.

The distribution of this subfamily is Australia and New Guinea where no representative of the subfamily Sittinae occurs.

The subfamily Sittinae, contrasted with Daphoenosittinae, has the bill subulate, the nostrils oval or round, non-operculate, or with a very slight operculum, and the nostrils more or less concealed by forward projecting bristles and feathers, the maxilla is not uncinate nor is it notched. Nasal, rictal, and interramal bristles are well developed, the wing is more rounded, the secondary primary being about equal to the sixth. In coloration the upper parts, including the upper tail-coverts and rump, are grayish or bluish, the crown and nape, or only part of the crown, may be brown or

[1] I am indebted to Mr. J. T. Zimmer and Dr. E. M. Mayr for criticizing the following section of the manuscript.

black. The under parts may be white or gray to buffy or chestnut or particolored or even partly black, but not streaked; there may be white on the under wing at the base of the primaries or light edgings to the inner web of the remiges but no light mark across the middle of the remiges. The young resemble in general the adult in plumage. The nest is placed in a cavity. Representatives of Sittinae occur from Timor and Java to Asia, in Asia, Europe and North America.

*Hypositta* quite properly is kept in a separate family, Hypositidae. The strikingly different features are the long, slender toes that might be taken for those of a Creeper; the amount of fusion between the toes, the outer toe is united with the middle toe for nearly the length of the latter's two basal phalanges, the inner toe is united with the middle toe for the length of the basal phalange of the latter; the long tail which is about three quarters the length of the wing; the peculiar coloration, the male being blue with black on the forehead, chin and lores, the female duller blue on the back, olive brown on the top and sides of the head and the underparts, the first year male is like the female.

The bill of *Hypositta* is shorter than the head, it has a ridged culmen, and is strongly uncinate and notched; the base of the bill is somewhat expanded; the nostrils are non-operculate, or very slightly operculate, partly concealed by forward projecting feathers, and there are well developed nasal and interramal bristles. In the shape of the bill this diverges widely from *Sitta* but is not very different from *Daphoenositta*, while the condition of the feathering at the base of the bill suggests that of *Sitta*.

The scutulations on the front of the tarsus are obscured, again suggesting *Daphoenositta*. The secondaries are comparatively long, giving a short wing tip. In feeding habits *Hypositta* is very Creeper-like, climbing silently up one tree trunk, then flying down to climb another trunk in its search for insects. Its nidification is unknown. *Hypositta* contains but a single species, *corallirostris*, which is restricted to the humid forest of eastern Madagascar.

Many peculiar forms have evolved in the isolation which Madagascar has afforded, and the affinities of many of them are obscure. The similarities between the shape of the bill in *Daphoenositta* and *Hypositta*, taken in connection with their peripheral distribution, suggests that this represents the primitive type of Nuthatch bill. In the structure of its foot and its feeding habits *Hypositta* recalls some of the Creepers (Certhiidae) and is perhaps most closely related to them.

*American Museum of Natural History,*
*New York.*

# SOME MISCELLANEOUS NOTES ON SOUTH CAROLINA BIRDS

BY G. E. HUDSON AND FRANKLIN SHERMAN

DURING June and early July, 1934, G. E. Hudson carried out intensive field work in the vicinity of Clemson College, S. C., in the employment of the Department of Entomology and Zoology. The object of this work was to collect as much data as possible on the breeding birds of the region. Most of the time was spent in the immediate neighborhood of the college but a number of one-day trips were made into various parts of the nearby mountains of Pickens County. Observations recorded here include some made during this period together with other scattered records that have been collected during the past several years by Professors Franklin Sherman and H. A. Rankin of Clemson College, and others.

Late in the summer of 1934 seventy-three bird-skins from the collection of the Department of Entomology and Zoology of Clemson College were sent to Dr. Harry C. Oberholser of the U. S. Biological Survey for subspecific determination. These were subsequently identified and returned. We are greatly indebted to Dr. Oberholser for this courtesy. The subspecific names that are based on his identifications are followed in the list by an asterisk placed in parentheses. Our appreciation is further extended to Professor Myron H. Swenk of the University of Nebraska for helpful suggestions.

**Gavia immer immer.** COMMON LOON.—On May 3, 1932, a female taken at Pendleton was brought to F. Sherman at Clemson College. This specimen is now in the college collection and constitutes our only record of this species for the vicinity.

**Aquila chrysaëtos canadensis.** GOLDEN EAGLE.—On November 16, 1934, J. E. Whitfield found one of these birds dead at a power line near Townville and brought it to Clemson College where F. Sherman identified it. This is our only record for the vicinity.

**Haliaeetus leucocephalus leucocephalus.** SOUTHERN BALD EAGLE.—T. P. Baskin brought in an immature specimen killed in the vicinity of Clemson College on May 24, 1930. This bird was examined by F. Sherman and is now in the college collection.

**Falco peregrinus anatum.** DUCK HAWK.—Reported by R. E. Ware and H. A. Rankin at Caesar's Head during the spring of 1933. The birds were seen flying in and out of a recess in the cliff.

**Falco columbarius columbarius.** EASTERN PIGEON HAWK.—A female in G. E. Hudson's collection was taken by Captain H. L. Harllee on St. Helena Island, Beaufort County, December 30, 1932. There are only a few other winter records for the state.

**Bonasa umbellus umbellus.** EASTERN RUFFED GROUSE.—In 1886 Loomis (The Auk, 1886, p. 483) recorded this species as common in the mountains of Pickens County. Sherman observed it twice near Rocky Bottom during the period 1929 to 1932, and also in northern Oconee County in March, 1935. It is, therefore, still present in the region although in greatly reduced numbers.

**Porzana carolina.** SORA.—E. S. Prevost brought in a specimen taken at Anderson on September 27, 1928; our only record.

**Gallinula chloropus cachinnans.** FLORIDA GALLINULE.—One caught in a college building on April 27, 1935, and identified by F. Sherman. It was later banded and released by R. E. Ware. This is our only record.

**Philohela minor.** AMERICAN WOODCOCK.—A rather rare permanent resident; more common in winter. F. Sherman has observed it at Clemson College on the following dates: August 17, 1930; July 18, 1931; November 16, 1934.

**Bartramia longicauda.** BARTRAMIAN SANDPIPER.—This species has been reported only rarely in South Carolina during recent years. G. E. Hudson observed three in a pea field near Florence on August 9, 1928.

**Limnodromus griseus hendersoni** (*). INLAND DOWITCHER.—Two specimens were taken by G. E. Hudson near Mt. Pleasant on August 15, 1927. Rowan (The Auk, 1932, p. 32) in his original description of this race reported a male from South Carolina, taken by Bishop at Mt. Pleasant on May 3, 1912.

**Larus argentatus smithsonianus.** HERRING GULL.—On June 4, 1931, a Mr. Teat brought in an immature female taken near the village of Six Mile. This species is very rare this far inland and the date is unusually late for this latitude. The specimen is in the college collection.

**Zenaidura macroura carolinensis.** EASTERN MOURNING DOVE.—A number of nests of this species were found at Clemson College during the summer of 1934. It was noticed that the brooding birds feigned injury only when young were in the nest. Birds with eggs flew directly away when flushed, hence it was possible to tell what was in the nest by the actions of the incubating birds. Further observations are necessary to determine whether or not this is an invariable procedure. Bent (U. S. National Mu. Bull. 162, 1932) throws no light on this subject.

**Bubo virginianus virginianus.** GREAT HORNED OWL.—One was brought in from Townville about the first of February, 1935, and identified by F. Sherman. This is our only record for the vicinity of the college.

**Strix varia alleni** (*). FLORIDA BARRED OWL.—Wayne (Birds of South Carolina, 1910) states that the typical form of the Barred Owl occurs in the upper counties of South Carolina. A specimen taken by J. O. Pepper at Central on December 8, 1925, was identified by Dr. Oberholser as *alleni*. Another specimen taken at Meredith, near Florence, by R. V. Segars on January 30, 1928, was also pronounced this form but was marked "not typical."

**Chordeiles minor minor** (*). EASTERN NIGHTHAWK.—Three specimens were taken by G. E. Hudson at Florence on the following dates during the summer of 1926: June 10, July 16, and July 22.. Florence is well within the usually accepted range of *chapmani* and since these birds were taken during the breeding season a slight revision of the ranges of the two forms is probably desirable.

**Colaptes auratus luteus** (*). NORTHERN FLICKER.—A winter visitant. A specimen taken at Clemson College on December 31, 1925, was identified as this form. Two other Flickers taken at Clemson College on March 23 and November 27, 1926, were pronounced typical *auratus*, which is the breeding form in South Carolina. A. L. Pickens (The Auk, 1928, p. 67) has reported *luteus* from the Piedmont Region on the basis of a specimen measured by himself.

**Dryobates villosus villosus** (*). EASTERN HAIRY WOODPECKER.—There are three specimens in the college collection taken at Clemson College: March 29, 1926; September 15, 1927; November 10, 1927. This region is well within the range of *audubonì* as given in the 1931 edition of the A. O. U. 'Check-list.' Apparently this is another case in which subspecific ranges are in need of revision.

**Tyrannus tyrannus.** EASTERN KINGBIRD.—This species is rather uncommon in the western part of the state but becomes increasingly abundant toward the coast.

**Myiarchus crinitus boreus** (*). NORTHERN CRESTED FLYCATCHER.—Specimens were taken at Clemson College on April 24 and May 14, 1926. This is apparently the breeding form in the Piedmont Region.

**Sayornis phoebe.** EASTERN PHOEBE.—Wayne (Birds of South Carolina, 1910) records the Phoebe as breeding only in the mountainous parts of the state. A. L. Pickens (The Auk, 1934, p. 537) recently reported this species as nesting at Greenville in "the past two or three years." G. E. Hudson found the Phoebe breeding commonly at Spartanburg about 1923. Loomis (The Auk, 1890, p. 39) observed it near Spartanburg during June, 1889.

**Otocoris alpestris praticola.** PRAIRIE HORNED LARK.—In 1891 Loomis (The Auk, 1891, pp. 56–59) reported this bird as being a common and regular winter visitant at Chester, flocks of hundreds of individuals having been observed. During many years of observation in the Piedmont Region neither Hudson nor Sherman has ever seen a Horned Lark.

**Cyanocitta cristata florincola** (*). FLORIDA BLUE JAY.—Four Blue Jays representing both winter and summer specimens were identified as *C. c. cristata* (equals *florincola*). This reversal of names, the reason for which Dr. Oberholser has given in 'The Auk' 1921, pp. 83–89, has not been accepted by the A. O. U. Committee on Nomenclature. (See Stone Auk, 1929, p. 447.)

The determination of these birds as the southern form does not substantiate the statement by Pickens (The Auk, 1934, p. 537) that "our Blue Jays remain dominantly northern."

**Corvus brachyrhynchos paulus** (*). SOUTHERN CROW.—One taken at Clemson College on November 26, 1926, by F. Sherman III.

**Sitta carolinensis atkinsi** (*). FLORIDA NUTHATCH.—Two specimens taken at Clemson College on February 15 and 22, 1926, were identified as *S. c. carolinensis* (equals *atkinsi*). Dr. Oberholser (The Auk, 1917, pp. 181–187) has explained this switch in names in 'The Auk,' but it has not been accepted by the A. O. U. Committee.

**Sitta canadensis.** RED-BREASTED NUTHATCH.—H. A. Rankin observed one of these birds at Clemson College on April 17, 1931. This is our second record for the vicinity.

**Telmatodytes palustris dissaëptus** (*). PRAIRIE MARSH WREN.—Two specimens, both males, were taken at Clemson College on April 13 and 25, 1927. Dr. Oberholser referred these birds to the race *iliacus* which is not accepted by the A. O. U. Committee.

**Turdus migratorius achrusterus** (*). SOUTHERN ROBIN.—Three specimens in the college collection were taken at Clemson College on the following dates: February 6, 1926; February 24, 1928; March 4, 1930. The Eastern Robin (*T. m. migratorius*) no doubt occurs here in migration.

Robins have greatly increased as breeding birds at Clemson College during recent years. As many as eighteen individuals were observed in a single day during July, 1934.

**Hylocichla minima minima** (*). BICKNELL'S THRUSH.—A male taken at Clemson College on May 3, 1927, constitutes our only record. The commoner migrating from here is the Gray-cheeked Thrush (*H. m. aliciae*).

**Lanius ludovicianus migrans** (*). MIGRANT SHRIKE.—A male was collected at Clemson College on November 9, 1927. This was perhaps a migrant from farther north but the breeding form here is still to be determined.

During the breeding season Shrikes are far more abundant in the eastern part of the state.

**Sturnus vulgaris vulgaris.** STARLING.—This species has greatly increased in numbers at Clemson College during the past six years. Flocks of forty or more were commonly encountered during the summer of 1934.

**Vireo solitarius alticola** (*). MOUNTAIN VIREO.—An unsexed specimen was taken at Clemson College on October 15, 1927. A singing male was observed at Caesar's Head on June 28, 1934.

**Protonotaria citrea.** PROTHONOTARY WARBLER.—H. A. Rankin observed two at Clemson College on May 2, 1931. This is our only record for the vicinity.

**Helmintheros vermivorus.** WORM-EATING WARBLER.—An unsexed specimen was taken near the base of Sassafras Mountain on June 26, 1934. Loomis (Auk, 1890, p. 127; 1891, p. 331) found it breeding at Caesar's Head and Mt. Pinnacle.

**Vermivora chrysoptera.** GOLDEN-WINGED WARBLER.—Our only Clemson College records are the following observations by H. A. Rankin: May 3, 1931, ten; April 25, 1933, two; April 21, 1935, one.

**Dendroica caerulescens cairnsi** (*). CAIRNS'S WARBLER.—On June 12, 1934, a singing male was observed near Mountain Rest, close to the North Carolina line. An adult male and a juvenile male were collected on June 26, 1934, near the top of Sassafras Mountain. Besides these the following were also observed: three adult males, one adult female, and one juvenile female. All of these birds were observed on the South Carolina side of the mountain, and as far as we are aware this is the first breeding record for the state.

**Dendroica cerulea.** CERULEAN WARBLER.—Some recent Clemson College sight records by H. A. Rankin are as follows: April 21, 1933, one; April 26, 1934, one; May 1, 1934, one; April 22, 1935, two; April 23, 1935, three; April 25, 1935, one.

**Dendroica dominica dominica** (*). YELLOW-THROATED WARBLER.—The following specimens, all males, are in the Clemson College collection: Clemson College, April 21, 1926; Florence, June 12 and 17, 1926. The Sycamore Warbler (*D. d. albilora*) has been recorded by Loomis (The Auk, 1890, p. 127) from Pickens County. We have never encountered this form.

**Geothlypis trichas brachidactyla** (*). NORTHERN YELLOWTHROAT.—Two males were taken at Clemson College on April 10 and May 1, 1926. These were doubtless migrants since this form breeds much farther northward.

Two other specimens taken at Clemson College, a male on Sept. 25, 1926, and a female on April 9, 1927, were identified as *G. t. typhicola*. This form was described by Burleigh (Proc. Biol. Soc. Wash., 1934, pp. 21–22) in 1934.

**Setophaga ruticilla.** AMERICAN REDSTART.—G. E. Hudson observed an adult male singing near Jocassee on July 3, 1934. This species undoubtedly breeds in the mountainous portions of the state, although there are as yet no definite records.

**Sturnella magna argutula** (*). SOUTHERN MEADOWLARK.—A dark-colored male was taken at Florence on May 15, 1926. This is probably the breeding form over most if not all of South Carolina. A female taken at Clemson College on February 18, 1927, was pronounced the Eastern Meadowlark (*S. m. magna*), but was marked "not typical." This subspecies is no doubt a winter visitant.

**Icterus galbula.** BALTIMORE ORIOLE.—J. A. Berly saw a male in his yard at Clemson College on June 12, 1928, and again on June 28 of the same year.

**Quiscalus quiscula aglaeus** (*). FLORIDA GRACKLE.—A male taken at Clemson College on November 23, 1926, was identified by Dr. Oberholser as *Q. q. quiscula* (equals *aglaeus*). Wayne (The Auk, 1918, p. 440) has shown the need of this change in subspecific names, but it has not been recognized by the A. O. U. Committee.

Burleigh (The Auk, 1934, pp. 91–92) has recently shown the Florida Grackle to be the breeding form in western as well as eastern South Carolina.

A Grackle was seen in Central on June 23, 1934. Several dozen were observed at Spartanburg on the evenings of August 22 to 26, 1934. These were roosting in water oak trees in company with English Sparrows and Starlings. During the brdeeing season Grackles are far more abundant in the eastern half of the state; in fact, they are almost rare in the Piedmont Region at this season.

**Quiscalus quiscula aeneus** (*). BRONZED GRACKLE.—A winter visitant. The following specimens have been taken at Clemson College: March 13, 1926, male; November 27, 1926, female; November 22, 1927, female.

**Molothrus ater ater.** EASTERN COWBIRD.—G. E. Hudson saw a female at Clemson College on June 11, 1934, but was unable to collect it.

On July 17, 1934, F. Sherman and several members of his bird class saw a fledgling being fed by a small foster-parent on the Clemson College campus. The bird in attendance appeared very nervous and did not allow a close enough approach for positive identification, but it looked like some kind of female Warbler in worn plumage. It was much smaller than the young Cowbird.

This is the first breeding record for the state although its breeding here has been suspected for some time since several of these birds were seen engaged in courtship antics on May 4, 1927, and a single male was seen on May 23 of the same year. Friedmann (The Cowbirds 1929, p. 147) gives the southernmost breeding range of the Cowbird in the Atlantic States as Virginia.

**Piranga erythromelas.** SCARLET TANAGER.—A common breeder in the mountainous portions of the state. During June and early July, 1934, it was observed at Mountain Rest, Mt. Pinnacle, Mt. Sassafras, Caesar's Head, Jocassee, and Little River near Salem.

**Spinus tristis tristis.** EASTERN GOLDFINCH.—An uncommon breeder in the Piedmont Region. During the summer of 1934 it was observed at Mt. Sassafras, Caesar's Head, Jocassee, and Spartanburg.

**Pipilo erythrophthalmus erythrophthalmus** (*). RED-EYED TOWHEE.—It was thought that perhaps the Alabama Towhee (*P. e. canaster*) might occur at Clemson College. However, two specimens submitted to Dr. Oberholser proved to be the typical form. These were taken on October 30, 1926 and March 25, 1927.

**Ammodramus savannarum australis.** EASTERN GRASSHOPPER SPARROW.—An uncommon and local breeder in western South Carolina. A colony of several pairs was located in a hay meadow on the Clemson College farm in June, 1934. A nest with four young was found on June 22. We did not observe this species elsewhere during the summer of 1934.

**Junco hyemalis carolinensis.** CAROLINA JUNCO.—On July 30, 1932, F. Sherman saw one of these birds near the summit of Sassafras Mountain at an elevation of about 3200 feet. This was on the South Carolina side.

**Melospiza melodia melodia.** EASTERN SONG SPARROW.—G. E. Hudson observed a singing male in the yard of the Attakula Lodge near Jocassee on July 3, 1934. Burleigh (The Auk, 1933, p. 226) reported the first breeding record for the state from Greenville County, May 25, 1931. Pickens (The Auk, 1934, p. 537) has recorded this species as "common in summer in the lower mountains." Our observations do not confirm this since during several weeks of intensive field work in the summer of 1934 only one bird was observed. Furthermore this was a species for which we were particularly looking.

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# A NEW ANTBIRD FROM VENEZUELA.

BY M. A. CARRIKER, JR.

WHILE recently working over a portion of the collection of birds made by Holt, Blake and Agostini on the Upper Orinoco, Casiquiary and Negro Rivers in 1931 for the U. S. National Museum, a series of specimens of *Formicivora grisea* was found which appears to represent an undescribed subspecies, a description of which appears below.

**Formicivora**[1] **grisea rufiventris** subsp. nov.

Type, ♀ adult, from Cerro Yapacana, Upper Orinoco River, Venezuela, No. 328964, Coll. U. S. Nat. Museum, collected by Holt, Blake and Agostini, April 7, 1931.

*Diagnosis:* Male almost indistinguishable from *F. g. grisea* of the Guianas, except that the upper parts are slightly darker brown and the wings are shorter (52 to 54 against 57 to 59 mm.).

The female, however differs decidedly, being much more richly colored. The upper parts are more rufous brown and the under parts rich, rufescent or cinnamon ochraceous, instead of pale ochraceous; supraloral streak and superciliaries cinnamon ochraceous instead of white; the wing coverts are almost entirely black, only the inner greater series being slightly shaded with chocolate brown, while the white tips are more pronounced throughout.

*Remarks:* In addition to the type there are 6♂♂ and 8♀♀, all from the same locality, also 1♂ and 1♀ from near Corocoro, upper Orinoco. The whole series is very uniform in color and size. A single ♀, however from Manaos, in the same collection, is an almost typical specimen of *grisea*, but approaches slightly the new race by having a faint creamy wash on the posterior portion of the superciliary stripe and in having the under parts a little more richly colored than the average Guiana birds.

In the same collection there is a series of skins of *Formicivora orenocensis*, 1♂ and 3♀♀ from the upper Orinoco, 2♀♀ from Puerto Ayacucho and a ♂ and ♀ from the Territorio Federal de Amazonas, Venezuela. The above records show that *F. orenocensis* and *F. grisea rufiventris* occupy the same territory (at least partially), and seem to invalidate Dr. Hellmayr's arrangement of this group, in which he makes *orenocensis* a subspecies of *grisea*. Further, it seems that his arrangement of the *grisea-intermedia* group is a most arbitrary one, and that the various races of these two forms fall very logically and reasonably into two well defined species, viz: the forms in which the females are unspotted or unstreaked below belonging to

[1] *Formicivora* Swainson 1825, is not invalidated by *Formicivorus* Temminck, 1807, according to ruling of the Committee on International Rules of Zoological Nomenclature.

*F. grisea*, while those which have the under parts spotted or streaked would fall under *F. intermedia*, as follows.

*F. grisea grisea* (Boddaert), Guianas and North Brazil.
*F. grisea rufiventris* subsp. nov., Upper Orinoco, Venezuela.
*F. grisea hondae* (Chapman), N. and Cent. Colombia, Valley of Magdalena.
*F. grisea alticincta* Bangs, San Miguel Island, Bay of Panama.
*F. grisea deluzae* Ménétriès, Southeastern Brazil.
*F. intermedia intermedia* Cabanis, N. and W. Venezuela and NE. Colombia.
*F. intermedia fumosa* (Cory), State of Zulia, NW. Venezuela.
*F. intermedia tobagensis* Dalmas, Island of Tobago.
*F. intermedia orenocensis* Hellmayr, Southern Venezuela.

*Academy of Natural Sciences,*
*Philadelphia.*

# NOTES ON THE HABITS OF THE FLORIDA GRASSHOPPER SPARROW.

BY WRAY H. NICHOLSON.

*Plate XVII.*

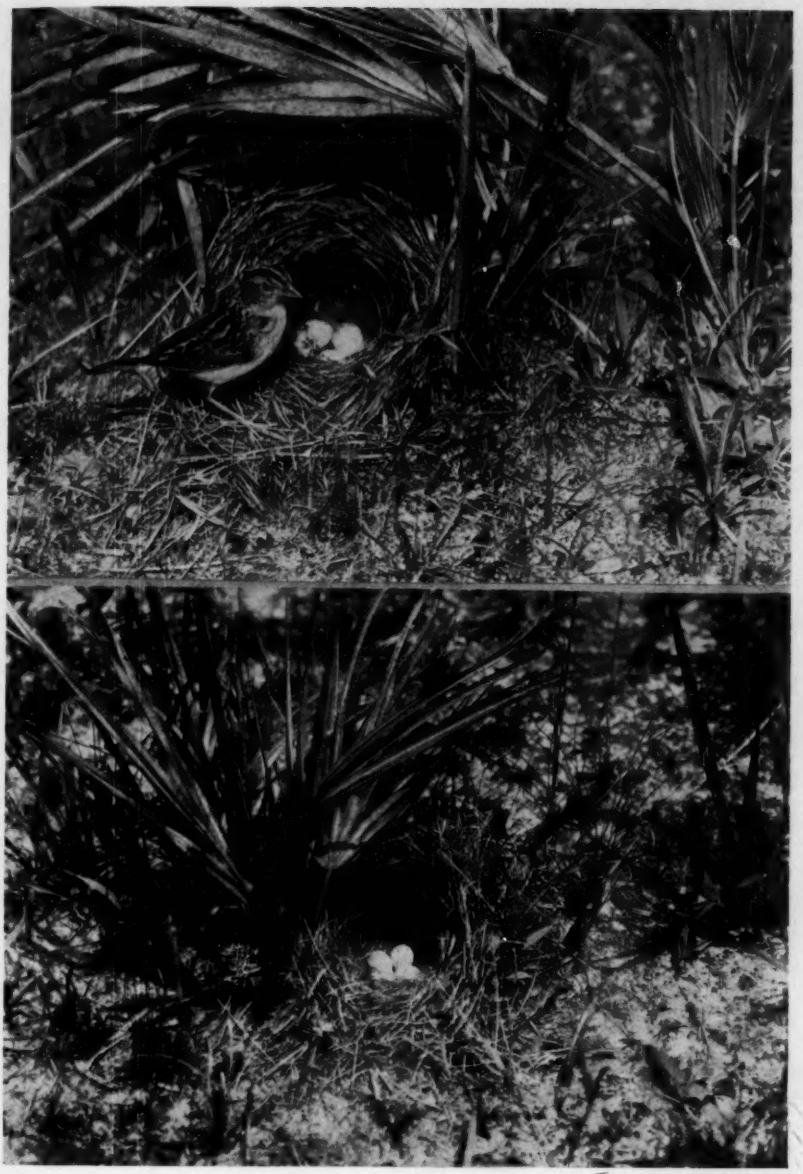
THE Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*) inhabits the Kissimmee Prairie region. So far as known its range begins at a point twenty miles southwest of St. Cloud and extends to Okeechobee City, over one hundred miles. The birds do not breed all over this area but form scattered colonies sometimes thirty miles apart. They no doubt nest farther south but have not yet been reported there.

This interesting Sparrow was first described by Dr. Edgar A. Mearns from a pair taken on the Kissimmee Prairie, seven miles east of Alligator Bluff, in 1902, but until the spring of 1929 ornithologists were unsuccessful in obtaining additional specimens. It is not surprising that the birds were overlooked as they blend so well with their surroundings, while their insect-like voice can scarcely be heard at a distance of one hundred feet on a still day.

Late in May, 1929, Arthur H. Howell and Donald J. Nicholson were fortunate enough to find a small colony about eight miles southwest of Kennansville in Osceola County, and Mr. Howell succeeded in securing nine adults and one young bird. On May 1, 1932, J. C. Howell, Donald J. Nicholson and the writer visited the locality and immediately found a nest of the Sparrow within fifty feet from where we had parked our car. It was situated at the base of a small saw-palmetto under a dead leaf, and was extremely well arched, with such a small entrance that it was almost necessary to get on our hands and knees in order to see the two fresh eggs that it contained. By dragging a long rope we discovered three other nests in course of construction and flushed a bird from near each, but this method was not very successful and we began to search for the nests eventually locating two with four eggs, one with three, and two with incomplete sets.

The area in which the birds were nesting had been burned over some time before and the vegetation was rather short, the main growth consisting of saw-palmetto and dwarf oaks (*Quercus minima*) which grow less than two feet in height. The birds seem to prefer this type of territory rather than the grassy spots. This colony covered an area a mile and a half in length by three quarters of a mile wide. We visited the spot again on May 8 and found several more nests with complete sets of eggs but no young were seen. About half of the nests under construction the week before seemed to have been abandoned.

The Florida Grasshopper Sparrow has a very peculiar song; to me it sounds like *twittle-e-dee* repeated several times in rapid succession with a



NESTS OF FLORIDA GRASSHOPPER SPARROW.

UNIV. OF MICH.

*tik-tik-tok-buzzzzzz* at the finish. Many times I heard them sing the latter part of this song without the former, but never the former part alone. The latter part has a distinct insect-like sound. When singing, the bird perches on a low dead palmetto leaf or on a dead oak twig several inches above the surrounding vegetation. They do not sing while flying and I do not think that the female sings at all.

On April 23, 1933, we found several nests with slightly incubated eggs and others under construction. On June 4 and 5 a number of nests were located but only four were occupied; one contained three young ready to leave the nest and an infertile egg, two held young a few days old and another four heavily incubated eggs. Another trip on June 19 to 21 found the birds in full breeding activities and proved to our satisfaction that they raise two broods in a season. It would appear that the second set is laid about eight weeks after the first and the incubation period was apparently eleven days. We found no nest with five eggs or young so that four seems to be the normal number.

Some of the birds were unusually tame or else trusted to protective coloration as they were almost invisible as they sat in their well hidden nests. When they did leave they did not fly but ran off dragging the tail and fluttering the wings as if crippled. If followed they would lead the intruder off about twenty feet from the nest and then fly to some nearby palmetto and begin scolding. Several times while examining a nest the bird would run along the ground within eight feet of me scolding with a weak *tik-tik-tik* note. One brooding bird remained standing on the edge of the nest while I approached to within five feet of her and I was able to extend my hand to within ten inches of her before she flew.

On these visits to the colony I had been unsuccessful in obtaining photographs of the birds as they refused to return to the nest while the camera was in position but on May 1, 1935, Hugo H. Schroder and I found a nest with four fresh eggs and secured a number of photographs of the bird.

Many of the nests were under a single dead palmetto leaf without any other vegetation to conceal them; others were under dead drooping palmetto leaves with small dwarf oaks and wire grass growing on all sides, while several others were in thin tussocks of dead wire grass which looked too small to hide a bird much less a nest. The birds always scratch out a slight depression which is then lined with fine wire grass and arched over with grass blades. All of the nests were arched.

Other birds found breeding in the vicinity of the Grasshopper Sparrows were Southern Meadowlark, Pine Woods Sparrow, Florida Bobwhite, Florida Nighthawk and Florida Burrowing Owl. One nest of the Meadowlark was within six feet of a Sparrow's nest.

*Orlando, Florida.*

## GENERAL NOTES.

**The Red-throated Loon in Montana—A Correction.**—In both the third and fourth editions of the A.O.U. 'Check-List,' *Gavia stellata* is listed as "casual" in Montana. The record upon which the species has been admitted to a place in the list of the birds of that state is given in detail by Mr. Aretas A. Saunders in his 'Distributional List of the Birds of Montana' (Pacific Coast Avifauna No. 14, 1921) as follows: "One taken at Mud Lake, Flathead County, July 15, 1901 (Silloway, 1901a, p. 38). The specimen is in the collection of the University of Montana. Occurs on the Yellowstone, near Billings, in migrations and winter (Thomas, MS.)."

Credit for detecting the error in identification of the Silloway specimen must be accorded Mr. Vernon L. Marsh, of Great Falls, Mont., who wrote the Biological Survey that he had examined the bird and that it was unquestionably an example of Holboell's Grebe (*Colymbus grisegena holboelli*). Mr. Marsh further stated that there was no specimen of *Gavia stellata* in the University collection, but that the Grebe carried a label marked "Red-throated Loon, *Urinator lumme*," this label being "very securely tied to the specimen and looks as though it had never been removed."

Further correspondence with Mr. Marsh resulted in the specimen being sent to the Biological Survey for examination. As stated by Mr. Marsh it is a perfectly typical example of *C. g. holboelli*. It is a female and is obviously the specimen collected and recorded by P. M. Silloway as *Urinator lumme* (Gunn.) in his paper on "Summer Birds of Flathead Lake," published in 1901[1] and again in his revised list published in 1903.[2]

In this second list, Mr. Silloway made the additional comment that "Specimens [had been] taken at . . . Rost Lake, 1901." No further details of this alleged occurrence are given.

The Thomas mentioned by Mr. Saunders as having noted the Red-throated Loon on the Yellowstone near Billings apparently is Gerald B. Thomas, of Billings, later of Long Beach, California. Mr. Thomas sent migration records to the Biological Survey during the period 1917–1920, but he did not furnish any of his older records. At least there is no record for this species for Montana in the files of the Survey save the oft-repeated misidentified Holboell's Grebe.

In the absence of specimen evidence the Red-throated Loon should be withdrawn from the list of Montana birds.—Frederick C. Lincoln, *Biological Survey, Washington, D. C.*

**Shearwaters and Ships.**—In the interesting paper "On the Habits and Distribution of Birds on the North Atlantic," by V. C. Wynne-Edwards (Proc. Boston Society of Natural History, 1935), I find the following statement in regard to the Greater Shearwater (*Puffinus gravis*): "As a rule they will not follow a liner. Very frequently one or two are to be seen among the Fulmars in the wake, but whereas the Fulmars make a business of it, these Hagdowns do not." From my own experience and that of others with whom I have talked I am led to believe that this does not tell the whole story. The Greater Shearwaters, as I have seen them, do not, to be sure, *follow* the ship to anything like the extent that the small Petrels and the Fulmars do, but they do accompany it for long periods of time, keeping more or less in front of it, though usually not very near, and crossing and recrossing the bows. Again, of the Manx Shearwater (*P. puffinus puffinus*) Mr. Wynne-Edwards says, "It takes no

[1] Bull. No. 3, Biological Series No. 1, University of Montana.
[2] Bull. No. 18, Biological Series No. 6, University of Montana.

notice of ships, either liners or fishing craft, except to fly away if they approach too close." And again my experience is very different from his, for those I saw in St. George's Channel in July, 1930, acted precisely like their larger relatives; they certainly appeared to take notice of our ship, for they kept along with it and crossed and recrossed our bows. In a short paper printed in the 'Bulletin of the Essex County Ornithological Club' for 1930 I noted this habit of the Shearwaters, as well as the corresponding, though different, behavior of the Storm Petrels and the Fulmar, and indulged in a little speculation on the origin of a habit that would seem to be of no particular practical use to the bird.—FRANCIS H. ALLEN, *West Roxbury, Mass.*

**Some Observations of the European Teal.**—In 1923 when Mr. Ludlow Griscom's 'Birds of the New York City Region' was published the European Teal (*Nettion crecca*) was listed as an accidental visitant from the Old World. J. G. Bell had reported several specimens from Long Island in 1858 and earlier; and two others had been shot out of a flock of Green-winged Teal (*Nettion carolinense*) at Merrick in mid-December, 1900.

Within the last decade *Nettion crecca* has either shown a decided local increase or else field observers have suddenly become conscious of the possibility of this species and the ease with which the drake can be identified even at a long distance. At any rate, to-day the European Teal can be regarded as a rather regular bird around New York City and we can quite constantly depend on seeing one, two or even three drakes of this species in a few chosen localities on Long Island any day from mid-November to early April.

On March 7, 1936, I observed two drake European Teal in a flock of Green-wings on the Hempstead Reservoir of Long Island. There was a third bird resting on a mud flat which I at first took to be a European Teal because of the conspicuous white scapular stripe. When this individual took to the water, however, it was at once suggestive that he was a hybrid for not alone did he possess the distinct scapular stripe and other marks of *crecca* but also the white bar on either side of the breast characteristic of *carolinense*. This bird was still present on the following morning when Messrs. R. P. Allen, R. T. Peterson and the writer visited the reservoir and we decided that in all probability it was a hybrid of *Nettion carolinense* × *Nettion crecca*.

Such a cross should be fairly regular in a place where both species occur for it is not a very rare sight in early spring on Hempstead Reservoir to see drakes of both the European and Green-winged Teals performing before the same duck. So far as I can ascertain the courtship demonstration of both species is practically identical and the drake Green-winged Teals show the same tolerance to competition from a drake European Teal as they do to competition from a drake of their own species. The entire courtship performance is rather dignified and impressive: the competing drakes hold their bodies high, partly erect their head feathers and circle the demure duck every now and then opening their bills wide and uttering a mellow *peep peep* with each forward thrust of the head. The pursued duck seems well pleased with the attentions as long as each suitor keeps his distance, only jabbing in disapproval when a bold fellow tries to get too familiar.

Since most of the wintering and migrant waterfowl on the Atlantic seaboard come from a general northwesterly direction it is likely that the European Teal occurring on Long Island represent birds from the Aleutian Islands where Mr. A. C. Bent found this species to be breeding commonly way back in 1911. And yet there is a possibility that a small number of European Teal nest somewhere in the interior of our continent and that the species is more widely distributed in the States during the non-breeding seasons than the meager records would indicate. Observers

throughout the country should be on the watch for this species.—ALLAN D. CRUICKSHANK, *Freeport, Long Island, New York.*

**Snowy Egret in Michigan.**—On August 10, 1935, Louis W. and Bernard R. Campbell collected a female Snowy Egret (*Egretta thula thula*) four miles southeast of Erie, Monroe County, Michigan, and have presented the specimen to the University of Michigan Museum of Zoology (now catalogue No. 85917). This constitutes the first unquestionable record of this species for Michigan.

Walter B. Barrows included this species in his list of Michigan birds (Michigan Bird Life, 1912: 141) on the basis of several alleged specimens. With a single exception, these records (including the one which Barrows incorrectly quoted as Norman Wood's record) were based on reports from A. B. Covert. Michigan ornithologists long ago learned the unfortunate necessity of ignoring Covert's records (Wilson Bulletin, 1913: 28) and in the case of at least two of the records here under consideration there are additional causes for doubt, not the least of which are Covert's own contradictory statements (mentioned even by Barrows). The one remaining specimen cited by Barrows is that from Kalamazoo in the collection of G. B. Sudworth. This specimen, now at the Roosevelt Wild Life Forest Experiment Station in Syracuse, was examined by Leonard W. Wing on August 19, 1932, and found to be not this species but the American Egret (*Casmerodius albus egretta*). A report of a flock of eight seen by Benjamin O. Bush near Kalamazoo "during the month of August" [1924?] (Bird Lore, 26, 1924: 402) is of some interest, although the possibility of confusion with the Little Blue Heron must certainly be kept in mind.—JOSSELYN VAN TYNE, *University of Michigan Museum of Zoology, Ann Arbor, Michigan.*

**Spring Occurrence of the American Egret in Ontario.**—In view of the scarcity of published records of the American Egret (*Casmerodius albus egretta*) from this province, it seems well to record a spring occurrence at Orillia, Simcoe County, Ontario, which is ninety miles north of Toronto.

In August, 1935, the writer accompanied by Mr. R. A. Smith, visited Mr. W. Sutherland, former taxidermist of Orillia, in search of local ornithological data. We were shown a beautifully mounted specimen of the American Egret in breeding plumage. It was adorned with 42 graceful, flowing 'aigrette' plumes. A label on the back of the case read: 'Great American Egret, April 30, 1908, Kean's Creek, foot of West Street, Orillia, Ontario.' According to Mr. Sutherland, the collector, the Egret was in company with several Great Blue Herons (*Ardea h. herodias*), when taken.

Spring records of Egrets are rare. There is a specimen in the National Museum at Ottawa, taken at Rockcliffe in the Spring of 1883 (Auk, Vol. 2, 1885, 110). One recorded by Seton (Auk, Vol. 2, 1885, 336) from Lake Nipissing in 1883, is now in the collection of the late Home Smith at the Old Mill, Toronto. There is another in the collection of J. H. Fleming of Toronto, taken at Port Union, Ontario, on May 24, 1895 (Auk, Vol. 23, 1906, 447). The writer is indebted to Mr. Sutherland for the privilege of recording this rare species.—O. E. DEVITT, *Toronto, Ontario.*

**A Red Phase of the Black-crowned Night Heron.**—To the best of my knowledge the Black-crowned Night Heron (*Nycticorax nycticorax hoactli*) has not to date been noted as having an erythristic phase. In the Dickey collection is a specimen collected at Laguna Beach, Orange County, California, on July 10, 1912, by Leon Gardner, which represents this phase in what is probably an extreme degree. It is an immature bird of unknown sex, but of just what age is uncertain since it does not

correspond with any of the plumage sequences set forth by Gross (Auk, 40, April, 1923). Dorsally it would seem to be in the "first nuptial plumage," since it has a streaked crown and also retains the juvenile wing feathers combined with a solidly colored, immaculate mantle. However, the underparts are unstreaked, although slightly clouded in an irregular manner. In color the mantle (including the wing coverts) is close to glossy "Hays Russet," and the underparts are distinctly tinged laterally and on the pectoral region with reddish instead of the usual grayish tones. The flight feathers and tail are normal in color.—A. J. VAN ROSSEM, *San Diego Society of Natural History, Balboa Park, San Diego, California.*

**Southern Winter Range of Ixobrychus exilis hesperus.**—Two adult males and one immature male were taken by the author near Huacho, Peru, in February, 1932. They agree in all particulars with the colors and measurements given by the describer of this bird, the tarsi and toes reaching the maximum given for the race. Apparently this is the first South American record for the subspecies. Peters (Check-list of the Birds of the World) gives a record from Panama with a question.

They were taken in a small marsh near the seacoast, caused by drainage from an irrigation system in the vicinity. Several others, mostly immature birds, were seen at the same place. It would thus seem that it is a regular winter visitor along the west coast of South America, as far south as central Peru.—M. A. CARRIKER, JR., *Academy of Natural Sciences, Philadelphia.*

**Invasion of Glossy Ibises in Puerto Rico.**—During the winter of 1935 and 1936 there was an unusual invasion of Glossy Ibises (*Plegadis falcinellus falcinellus*) in Puerto Rico. Previously the species was not definitely known to occur on the island. On September 14, 1935, I observed an individual in immature plumage in some mangrove swamps east of Parguera, but it proved impossible to collect it. During December, 1935, and January, 1936, I received from various sources information regarding flocks of as many as thirty individuals seen at Guànica and Anegado Lagoons. On February 13, 1936, a hunter brought me two adult females in winter plumage which he had just shot at a small lagoon near Afiasco; these are now preserved in my collection. It is impossible to state yet whether individuals will remain to breed in Puerto Rico, or if this was a sporadic post-breeding season migration such as is well known to take place in certain Herons.—STUART T. DANFORTH, *University of Puerto Rico, Mayagüez, Puerto Rico.*

**Ring-necked Duck in Berkshire County, Mass.**—On April 24 of this year Mr. G. Bartlett Hendricks and myself identified a raft of three male and about eighty female Ring-necked Ducks (*Marila collaris*) on Stockbridge Bowl, Stockbridge. The following day Mr. Hendricks identified two males on Onota Lake, Pittsfield. In both cases the observers were able to see the markings on the bills as well as other distinguishing characteristics. This is the first known record of the Ring-necked Duck in Berkshire County.—S. MORRIS PELL, *Lenox, Mass.*

**Bay Ducks Frozen to the Beach.**—When a severe cold wave strikes Long Island it is not unusual to have even the large tidal bays freeze over, but seldom is the temperature sustainingly low to have any effect on the very saline ocean waters. During the past winter, however, we experienced one of the most persistent cold spells Long Island has had in over a score of years and not alone did streams, ponds, bays and tidal creeks freeze over, but the ocean surf itself finally succumbed and turned into a pulpy, soupy mass . . . heavy dead waves would come wearily up to the shore and drop with a thud sending a slushy mass of ice rolling up on the beach.

The American Goldeneye (*Glaucionetta clangula americana*) and the Greater Scaup (*Nyroca marila*) are generally classed as Bay or Sound Ducks in our region, but when sudden frigid spells stiffen such bodies of water these species are forced to take to the ocean. At such times it is not unusual to see some of these birds resting on the beaches and they do so with no ill effects. But the unusually cold weather this year evidently presented many of these bay species with a rather new problem for if they chanced to be resting on the slushy beaches as the tide ebbed, the slush free of the tempering effect of the water would freeze almost instantaneously sealing the unfortunate Ducks to the ground.

During the first week of February on the south shore of Long Island I found fourteen Golden-eyes and Scaup frozen fast to the beach, some dead, some struggling desperately to get loose. It was absolutely impossible to chip the encased live birds out of their trap. In fact, the only humane thing to do was quickly to terminate their suffering for in their strenuous efforts to get loose they invariably ripped their very skin and were found bleeding and messy.

The regular Sea Ducks seemingly knew how to avoid this icy slush for only one of them, a White-winged Scoter (*Melanitta deglandi*), was found in this predicament. I wonder if this situation is unusual or whether annually many Ducks meet their death in this fashion on more northern shores?—Allan D. Cruickshank, *Freeport, Long Island, New York.*

**Effect of Extreme Cold on Ducks in Milwaukee Bay.**—During the month of February of this year the extreme cold caused the death of hundreds and probably thousands of winter Ducks on Lake Michigan in the Milwaukee area.

Steamship Captains reported that Lake Michigan was practically frozen across. Only small open areas existed at intervals many miles off shore. Otherwise the only open water near Milwaukee was that irregularly kept open in the shipping lanes, and at the warm water outlet of the Milwaukee Sewage Disposal Plant. At the disposal plant the open area was about 200 feet long and 60 feet wide.

On February 21 Mr. Walter Dethloff of the Wisconsin Humane Society, asked the aid of the Museum Staff in the removal of many frozen in but still living Ducks.

We found the open water to be crammed with birds, mostly Old Squaws (*Clangula hyemalis*). The greater number were females. The next numerous were Greater Scaup (*Nyroca marila*) and only a few of the Lesser Scaup (*N. affinis*) were present. The Ducks were picking up bits of waste material flowing from the plant and the thin ice at the edges was rimmed with the dead and dying birds. At one point where the piling composing the inner breakwater offered shelter, dead Ducks were piled several deep. The dying birds were feebly struggling, and with few exceptions those on the ice were held prisoner by the freezing down of primaries or breast feathers and in many cases both. Dangerous ice made the recovery of many of them impossible, but nevertheless about fifty of the living birds were chopped out and delivered to the Milwaukee Zoo where most of them died. While we were there a car-ferry plowed through the partially open lane and literally hundreds of the imprisoned Ducks were helplessly churned under and ground among the large blocks of ice. Out on the hard ice dead Ducks which had been frozen down were to be seen as far as the horizon, but most of them were concentrated at the edges of the open places. Golden-eyes suffered the most, and next in abundance the Greater Scaup. We found a few dead American Mergansers (*Mergus americanus*) and a few Old Squaws. One immature female King Eider (*Somateria spectabilis*) was also found frozen down. The Herring Gulls (*Larus argentatus smithsonianus*) were there in numbers and they waxed fat upon the carcasses.

Many of the birds which were in fair condition were saved as museum specimens. All birds examined were in an extremely emaciated condition, digestive tracts were empty with the exception of several Golden-eyes which contained a quantity of rubber bands and other small bits of rubber. One Merganser contained string and a mass of hair-like substance. One female Greater Scaup was completely oil soaked and scarcely able to swim.

The limiting of the open water areas reduced the possibility of feeding to a minimum, and we concluded that starvation brought about the above condition. Fortunately at this writing the weather has moderated and the thaws have made available large areas of open water for feeding.

We are much interested to know to just what an extent this condition prevailed upon the Great Lakes, particularly in our area.—O. J. Gromme, *Milwaukee Public Museum.*

**Mexican Turkey Vulture (Cathartes aura aura) at Brownsville, Texas.**—While on a collecting trip to Brownsville, Texas, in the spring of 1930, I obtained three sets of eggs of the Turkey Vulture near the Rio Grande on the American side. These eggs are noticeably smaller, less marked, and of a paler creamy ground color than those of the same species that I have seen from elsewhere in the United States. They are nearly uniform in size and average 66.3 by 45.8 mm. in size, whereas the average measurements of the Turkey Vulture's eggs taken farther north are about 71 by 48.3 mm.

With this in view H. C. Blanchard of Brownsville, Texas, collected for me four Turkey Vultures during that fall. It develops that two of these are practically typical examples of the race inhabiting Mexico and Central America, *Cathartes aura aura.* Except for some fossil bones that Dr. Alexander Wetmore recently recorded from central western Texas this form of the species has never before been reliably reported from the United States.

The two specimens mentioned above are in my collection of Falconiformes; and their data are as follows:

*Number A-577.* Female, September 30, 1930, Brownsville, Texas.
Length of wing 487 mm.
Length of tail 235 mm.
Length of tarsus 59 mm.

*Number A-579.* Female, October 11, 1930, Brownsville, Texas.
Length of wing 488 mm.
Length of tail 240 mm.
Length of tarsus 62 mm.

The other two specimens collected about the same time are migrant birds of the western subspecies, *Cathartes aura teter,* recently described by Dr. Friedmann.

All these specimens have been identified by Dr. Harry C. Oberholser of the Biological Survey.—Herbert W. Brandt, *Cleveland, Ohio.*

**Additional Notes on the Prevalence of the Adult Marsh Hawk in South Florida.**—In 'The Auk' (1935, p. 209) the writer gave some comparative figures on ratio of adult male specimens of *Circus hudsonius* as against females and immature birds.

Having occasion to visit south Florida again in February 1936, the writer again kept careful check on this matter. This time, the country *east* of Lake Okeechobee was surveyed, the route being down the eastern shore to the extreme southeastern

corner of the Lake, thence east to Palm Beach, and west across the Tamiami Trail to Everglades. A total of sixty-one specimens was noted, of which twenty-five were adult males! This gives about one adult male to two and a half specimens seen! A decided increase above the ratio noted in the January trip, high as that was.

About the region lying southeast of Lake Okeechobee, the Marsh Hawk is very abundant and on two occasions five consecutive birds noted, were adult males! In a string of fifteen noted between Belle Glade and a point about half way to Palm Beach, eleven birds were adult males. South Florida seems to be far more prolific in adult males of this species in the winter range than any locality of which the writer has knowledge.—ALEXANDER SPRUNT, JR., *R. F. D. No. 1, Charleston, S. C.*

**Bone Healing in Young Marsh Hawks.**—In connection with some work on the food habits of the Marsh Hawk (*Circus hudsonius*) near Ruthven, Iowa, it has been part of our technique to tether the larger and more active nestlings in the vicinity of their nests in order to prolong the period of profitable study (Errington, Condor, 1932, pp. 75–86). During the summer of 1933, two immature Hawks, thus tethered, suffered broken legs and were brought in to the field laboratory for treatment. They were given the same food (small vertebrates) upon which they had been feeding in the wild. Notes were taken on their recovery as a matter of interest.

Particular attention was paid to the rate of return of function to the injured legs. It was not until the Hawks showed evidence of a fatal mouth disease that they were killed and the healed bones dissected out.

Hawk No. 1 broke its left tarso-metatarsus at about the mid-point on July 7. It was then 22 days old, at which age the young have commonly attained about three-fourths of their adult growth, and their bones, while fairly well formed, are still not enough calcified to be very strong. The young usually begin to fly at about five weeks (Breckenridge, Condor, 1935, pp. 268–276), and at three weeks are able only to walk and flap clumsily through the grass.

Although the bone slipped after bandaging, it is likely that the leg would have been somewhat less straight after healing had it not been for our aid. It is entirely possible, however, that the healing would have occurred naturally without serious deformity, as the positions assumed by the Hawk in standing and sitting tended to keep the leg comfortably outstretched.

By July 18, 11 days after the fracture, Hawk No. 1 (an unexcitable bird which had become tame) was using its injured leg to fair advantage; by July 21, the leg was quite functional; and by July 29, no indications of favoring were to be noted.

Hawk No. 2 was brought in on July 17, its left tibia broken near the distal end. This individual was between 29 and 31 days old, well developed, and with juvenal plumage predominating.

In this case, the loose bandage put on probably had slight if any influence in keeping the healing bone in place; and the bird was not disturbed except for an examination of the injury on July 21, at which time, four days after the break, the bone had not set.

By July 27, ten days after the break, the Hawk was beginning to put weight upon the leg, especially in the course of frenzied efforts to escape (contrasted with Hawk No. 1, No. 2 was untameable and reacted violently to human presence). Two days later, Hawk No. 2 was regularly using its weak leg, though not with complete freedom.

Recovery had progressed sufficiently by August 3 so that Hawk No. 2 was occasionally using its weaker leg to strike with when approached. In walking, most of the weight was borne by the uninjured leg, but this was partly due to a slight bow-like

deformity resulting from the position in which the tibia end had healed. The leg had much recovered by August 9, and the bird was striking viciously with it.

Both Hawks were killed on August 10, No. 1 on the 34th day and No. 2 on the 24th day after injury, and 23 and 14 days respectively after the use of the legs had obviously been resumed.

It may be said that the time required for the healing of broken leg bones was practically the same for the two nearly grown Marsh Hawks studied. As might be expected of a raptorial species having access to abundant calcium in the bones of its prey, recovery took place rapidly, voluntary function being regained about the 11th day after injury, and emergency function at least a day earlier.—PAUL L. ERRINGTON, *Iowa State College Ames, Iowa.*

**Purple Gallinules (Ionornis martinica) are Predatory.**—For many years I have known that the Purple Gallinule (*Ionornis martinica*) was predatory, as I have seen them take the young and eggs from the nests of Herons and Egrets and other birds a great many times.

My first knowledge of their predatory habit was more than thirty years ago. At that time, I was raising Wood Ducks (*Aix sponsa*) along the edge of my Heron colony now known as "Bird City." The young Ducks were inclosed by a fine-meshed wire fence with an overhanging top, so that they could not climb out or stray away. From time to time I would miss some of them and was at a loss to know what was destroying them, as they were closely confined at night, and in the daytime, were in water too shallow for loggerhead turtles or other predatory creatures.

As the loss continued with great regularity, I built a blind near the pen and put an old darky to watch. In a few hours he came to me and stated that the young Ducks were being taken by "dem blue marsh hens." Knowing that he meant Purple Gallinules, I did not give his statement credit, but decided to watch for myself.

Getting into the blind, I soon was convinced that the Purple Gallinules were the reason for the disappearance of my young Ducks, some of which were almost half-grown and beginning to be quite well feathered. I had hardly gotten into the blind when a Purple Gallinule flew from the rushes of the pond beyond the fence, alighting in the shallow water near the bank and quite near me. There were no Ducks near where it lit, but a number of them were feeding towards it perhaps fifty feet away. The Gallinule walked along in the shallow water on the border of the pond, seemingly busily searching for insects, as it moved slowly and pecked from time to time in the grass which grew out from the bank into the water. It paid no attention to the Ducks, as they approached, until they came directly to it, when suddenly it sprung onto the back of one of the largest, and at one stroke of its beak severed the spinal cord at the base of the brain. It then proceeded to peck a hole in the back of the dead Duck, which was accomplished with remarkable speed, the viscera being drawn out piece by piece and eaten. After eating the viscera, it continued pulling out, through the back, bits of flesh. I had taken my gun into the blind with me, and shot it as it stood on its victim.

Supposing this was an unusual case of the Gallinule preying on the young Ducks, I did not wait to see if more Gallinules would attempt the same thing, but as from day to day I continued to miss my young Ducks, I had a watch set covering a full day, arming the watchman with a gun, and he killed five Gallinules, three of which had already gotten young Ducks before he shot them.

In later years, I have seen Purple Gallinules many times take eggs and young of many species of birds. This predatory habit was brought definitely to my attention during three consecutive days—on May 10, 11, and 12 of this year.

On Sunday, May 10, Stanley Solar and I were observing a large colony of nesting Boat-tailed Grackles (*Cassidix mexicanus major*). We had already remarked the large number of empty nests, that the Sunday before, had contained small birds. We heard a young Grackle crying in distress, and on going toward the place from where the noise came, saw a Purple Gallinule standing on the edge of the nest holding with one foot a half-grown Grackle while it deliberately tore at its back with its beak. On our nearer approach, the Gallinule took the still living young Grackle in its beak and flew with it about 75 yards to the pond's bank, where we watched it tear it to pieces and eat it. It first tore a hole in the back of its victim, and pulling out the viscera in sections, swallowed the pieces as they came free. It then tore bits of tender flesh from the body, paying no attention to my approach in a boat to within about sixty feet of it.

On Monday, May 11, I was in "Bird City" with Mr. and Mrs. Orr, who were photographing the birds for the Fox Movietone Corporation. My attention was attracted to a Purple Gallinule by the flirting of its white tail. It was standing on a willow stump about forty yards from us, and I called attention to its pulling strongly at something held under its feet. We could see it was the body of a young Heron. After considerable pulling and pecking, a hole was evidently torn through to the viscera, which we saw this Gallinule draw out in sections and eat. I was at the point of going to investigate in a boat, when a second Gallinule flew at the one on the stump and endeavored to rob it of its prey. The feeding bird seized its victim in its mouth and flew with it to an unoccupied section of a nesting platform nearby where it continued its meal.

On Tuesday, May 12, I had my floating blind, from which I photograph the nesting individuals of "Bird City," moved to a position where we could get close-ups of nesting Anhingas (*Anhinga anhinga*). I had the men with me clip a few twigs that obstructed the view of two nests low down in a cypress, each containing four eggs. The blind was set in position to photograph a nest quite near, in which the young Anhingas were more than half-grown. The moving of the blind and the noise of getting the three cameras set up frightened the Anhingas from the nests, and they flew to the top of several partly dead cypress trees nearby. All of this preparation took perhaps ten minutes. When we were about ready to begin the picture-taking, I looked towards the two Anhinga nests in the cypress from in front of which I had had the screen of twigs cut, and saw a Purple Gallinule standing on one nest eating a young Anhinga it had torn from its egg. Fearing it would destroy the entire set of eggs, I went outside the blind, and by waving my arms, frightened it away.—E. A. McIlhenny, *Avery Island, La.*

**A New Illinois Record for the American Avocet.**—On the afternoon of October 28, 1935, three men were hunting from a blind on a Mississippi River sand bar two miles South of Quincy. Late in the afternoon, as they were watching the shore-birds playing on the beach, a flock of large white birds with black wings settled among the Killdeer. As they alighted, they held their wings above their heads for a moment, then settled and began feeding in the mud and sand, moving their heads and long up-curved bills back and forth in the water. One of the hunters whistled a Plover-like call. The entire flock of eleven birds took wing immediately and circled over the wooden decoys. One hunter shot into the flock and killed two of the birds which were brought to me for identification.

They proved to be a pair of American Avocets in typical fall plumage. The specimens weighed eleven ounces and were in fine physical condition. Good skins

were made from them and they will be placed in some one of the museums for which I occasionally collect.

Insofar as I can find, there is no recent record of the killing of an American Avocet in this section of Illinois. According to Bent in his 'Life Histories of North American Wild Fowl' there was a sight record of two birds on May 5, 1889, at Chicago. Two were killed in St. Clair County, directly across from St. Louis, Missouri, on October 28, 1878, and one was killed in St. Louis, Missouri, on the same date. Probably all were members of the same flock. It is a coincidence, perhaps, that the three records along the Mississippi were all made on October 28, although there was a variance of fifty-eight years in the occurrence.—T. E. Musselman, *Quincy, Illinois.*

**The Stilt Sandpiper Again on the Lower Savannah River.**—A specimen of the Stilt Sandpiper (*Micropalma himantopus*), was taken October 20, 1935, and duly recorded (Auk, Jan., 1936, 81).

This spring in the same general area, others of this species have been seen at various times. This low land which fills with rain water is a part of the original river bed, but now for many years it has been shut off by jetties, and later by fills. It is about seven miles east of Savannah, and is, technically at least, in South Carolina.

One bird of two was shot March 22, 1936. Another out of a group of four was collected March 29, and a few minutes later I counted eighteen together, under excellent conditions for observation. On April 5, I forgot my binoculars, but think one was present. Then I saw one several times on April 12, once with a Dowitcher, a Pectoral Sandpiper and two Lesser Yellow-legs, it was in the field of my binoculars at a very satisfactory distance. The rain water was nearly dried up on April 19, and the small flock of Lesser Yellow-legs very nervous, one Stilt Sandpiper flew by with them.

Several flocks of Lesser Yellow-legs close to the river entrance were closely observed, and I have watched the fairly numerous Yellow-legs near the dredge, about four miles inland, but have seen no Stilt Sandpipers except in the one rainwater pool.

Considering that this species is a regular spring migrant on the east coast of Florida, and rare elsewhere on the Atlantic coast, one suspects an overland migration route from here to the Mississippi valley, as with the Ring-necked Duck (*Nyroca collaris*).—Ivan R. Tomkins, *U. S. Dredge "Morgan," Savannah, Ga.*

**European Woodcock (Scolopax rusticola rusticola) in Ohio.**—During the autumn of 1935 I became interested in the story of a Cleveland sportsman, Mr. G. F. Dixon, concerning a "large" Woodcock which he had recently shot. Upon questioning him it was learned that this Woodcock, before it was dressed weighed ten ounces, as against five to seven ounces which Mr. Dixon had found to be the range of weight in a considerable number of other Woodcocks taken by him over a period of years. Upon further questioning it developed that Mr. Dixon was still in possession of the body of this large Woodcock which had been dressed and prepared for cooking. The writer was permitted to examine the carcass and was greatly impressed by the large size and the pale color of the flesh when compared with similarly dressed bodies of other Woodcocks. Mr. Dixon gladly consented to save the skeleton of this large Woodcock and to present it to The Cleveland Museum of Natural History. This skeleton was unfortunately incomplete, the head, wings, and feet having been removed and destroyed. However, enough bones were preserved to show a considerable difference in size from a normal American Woodcock skeleton, and my suspicions were strengthened that the specimen represented the European species. Shortly afterwards these suspicions were substantiated by Dr. Harry C. Oberholser who identified the skeleton as that of *Scolopax rusticola*. This species has been taken occasionally

in the Atlantic coast region of North America, but hitherto never recorded for Ohio, or, as far as I am aware, from any locality farther west than Pennsylvania and Virginia. The specimen in question was taken along with individuals of the American Woodcock from the wooded banks of a stream in Newbury Township, Geauga County, about twenty-five miles east of Cleveland, Ohio, on November 6, 1935.—JOHN W. ALDRICH, *The Cleveland Museum of Natural History, Cleveland, Ohio.*

**Rare Shore-birds on the Massachusetts Coast.**—*Limosa haemastica.* HUDSONIAN GODWIT.—On August 30 and 31, 1935, there was a flight of Hudsonian Godwits on outer Cape Cod which considerably surpassed any recorded movement of the species in recent years, even for that favored locality. On the 30th, there was a moderate easterly storm, with steadily increasing wind and rain from daylight until about 4 o'clock in the afternoon; a lull of something less than an hour; followed by fog and a light drizzle until after dark. I describe the weather in some detail because it has been my experience, based now on three flights, that these are the exact conditions under which flocks of Godwits, as distinguished from scattered birds, are likely to occur on the Massachusetts coast between August 20 and September 5. Upon my arrival at Nauset Inlet, Orleans, at 1 P.M., a flock of 13 was already present on the flats back of the point, and they were joined at 2.30 and 3.15 P.M., respectively, by groups of 30 and 39, to make a total of 82. I had them under observation the whole afternoon until at 6.10 P.M., with fog shutting in and daylight failing, they got up in one compact flock, went straight out over the Inlet until almost lost to sight, and turned south down the coast. They were all adults, changing from summer to winter plumage. For an hour or two after their arrival they appeared very tired and sluggish, standing with heads under their wings, but late in the afternoon they became fairly active, breaking up into small groups, walking rather sedately along the water's edge, and probing in the soft sand sometimes to the full length of the bill.

On the following day I heard a rumor that a much larger number of Godwits had been seen at Monomoy Point, some 20 miles south of Nauset Inlet; and this story I was later able to trace to Mr. Frank Eldredge of Chatham, who is an old-time gunner, apparently thoroughly familiar with Hudsonian Godwits, and considered reliable. He was staying at Monomoy Point on the 30th, noticed the first Godwits at about 2 P.M., saw a number of flocks go over, and later in the afternoon had his attention called to a flock on the flats in the Powder Hole which he estimated at 150. Some of these were still present as late as 8 A.M. on the 31st. He is very sure that he saw between 400 and 500 in all. Whatever doubts might be raised as to the value of this estimate, I am satisfied that Mr. Eldredge knows the bird on sight, and that he saw large flocks. In conjunction with the known presence of 82 Godwits at Nauset, which could not possibly have reached Monomoy before dark, I think Mr. Eldredge's observations may be accepted as indicating a very substantial flight of this rare and interesting shore bird.

*Recurvirostra americana.* AVOCET.—On September 10, 1935, I had the great pleasure of discovering an Avocet feeding in a shallow salt-water pool on the flat behind the North Point at the mouth of the North River, Scituate. This was at high-water, about 9.30 A.M. Having watched the bird for half an hour, I returned home to secure either corroborating witnesses or a gun; but on my return with both, the bird was gone. We searched all afternoon, and were at it again early the next morning, but to no avail. So matters stood at noontime on the 11th, when Mr. Ludlow Griscom called by telephone to say that Mr. Davis Crompton of Worcester and Pocasset had seen an Avocet at 11 A.M. in the Sagamore marsh near the easterly end of the Cape Cod Canal, in Bourne, about 35 miles down the coast from Scituate.

At 3.30 o'clock I met these two gentlemen at Sagamore, and by 5.30 the bird was safely secured, after such difficulties with quicksands and mud as are not often encountered in New England collecting. It was an immature male. It is on exhibition at the Boston Society of Natural History, and apparently constitutes the first Massachusetts record since 1896.—Joseph A. Hagar, *Ornithologist, Massachusetts Division of Fisheries and Game.*

**Trans-Atlantic Flight of Gull-billed Tern.**—The record of a banded Gull-billed Tern (*Gelochelidon nilotica*), recovered on the island of Barbados, British West Indies, adds another bird to the list of those that have crossed the ocean.

Under date of September 13, 1935, the American Consul at Barbados, B.W.I., transmitted through the Department of State a copy of the following item, which appeared in the "Barbados Advocate" of September 6, 1935:

"To the Editor:

Dear Sir,—Please publish in your paper if you think it will be of interest to your readers.

A whitish bird with a wing spread of about fifteen inches was shot at Maynard's Swamp yesterday (September 4) bearing a metal tag inscribed Zool. Museum, Copenhagen, Denmark RK. 2929.

This may catch the eye of some of the enthusiastic bird shooters.

Thanking you,

Yours truly,

N. Kellman, Sand Street, St. Peter."

The Biological Survey immediately wrote to Dr. Å. Vedel Tåning, Director of the Marine Biological Laboratory in Copenhagen, who is responsible for the banding work of the Zoological Museum, and has been advised that the bird in question was a Gull-billed Tern, banded at Tipperne, Ringkjøbing Fjord, Jutland, on June 17, 1935. The chick was at that time about one day old and Dr. Tåning reports that "it left its home about July 20th . . ." He ventures the opinion that the bird made the trans-Atlantic flight in "probably less than a month. No tropical disturbances were recorded at that time in Barbados nor in the week previous to the recovery of the bird."

Dr. Tåning adds that "the record will soon be published," but since it is assumed that this will be in a Danish publication and so may escape the attention of most American ornithologists, it seems desirable to record it also in 'The Auk,' particularly since it may have some significance with reference to the American birds of this species, which, since the Eighteenth Supplement to the A.O.U. 'Check-List' (Auk, 1923), has been given subspecific standing under the name of *Gelochelidon nilotica aranea*.—Frederick C. Lincoln, *Biological Survey, Washington, D. C.*

**Little Gulls again in New York Harbor.**—Every spring, from the middle of April to early May flocks of Bonaparte's Gulls (*Larus philadelphia*) follow the wake of the Staten Island ferryboats, to feed on something churned up by the screws. Ever since 1929 we have watched them with added interest, because of the hope of seeing a Little Gull among them. This year my search was again rewarded on the morning of May 1. Among the Bonaparte's Gulls following a ferry passing us toward the south there appeared to be two Little Gulls (*Larus minutus*). One of them soon switched over to the wake of our boat and was well examined with glasses at about 75 yards. The other seemed to follow its example, but was by this time so far back as to make identification less certain. The black under wing-coverts are always the

best field-mark, provided the observer is not looking down on the bird, as I happened to be in May, 1929.

I believe that these two individuals may well be the same ones we have been seeing for several years. It seems more likely that they reached this region by way of northwestern North America than that they came across the North Atlantic. Their close association with Bonaparte's Gulls suggests that they first accompanied birds of that species on their southward migration, and now winter with them, though they probably do not migrate as far as the breeding ground of Bonaparte's Gull. Indeed two Little Gulls which had already molted from the breeding dress were seen several times between July 27 and August 27, 1933 near Great Kills on the Staten Island shore.[1]

One was seen again that afternoon by Marc C. Rich and at 6 P.M. by me, while on May 3 at 5 P.M. and again on May 4 Mr. Rich observed it. On every occasion it was in the company of Bonaparte's Gulls.—James P. Chapin, *American Museum of Natural History, New York.*

**Status of the Black-backed Gull.**—In the January number of 'The Auk' (Vol. 53, p. 81) reference was made to an early migration of the Black-backed Gull (*Larus marinus*) on the Atlantic coast as far south as southern New Jersey by the last of September. This note has brought forth a number of comments on the distribution and migration of the bird that seem worthy of further mention. Harry S. Hathaway, of South Auburn, Cranston, Rhode Island, wrote that he observed an adult of this species on August 5, 1935, and on almost every day thereafter until September 5, when two adults were present resting on the sand flats that border the southern edge of Quonochotang Pond near Charleston, Rhode Island. No Black-backed Gulls were seen again until September 15, when a flock of twelve appeared at this same place. Eight of the birds were in adult plumage while four were young of the year. Mr. Hathaway writes:

"Doubtless this flock was part of a wave that was migrating on the most favorable wind, strong southeast, with light rain and moon full, causing high tides. None seen again until November 2, when one bird was in the same locality."

Mr. Hathaway further records that these are his earliest records for Rhode Island, and he states that the birds normally do not make their appearance until early in October.

Mr. J. T. Nichols, of the American Museum of Natural History, in commenting on the early appearance of Black-backed Gulls on Long Island, New York, wrote:

". . . Of recent years a few individuals, adult and sub-adult, have oversummered there. Prior to this it is my memory that the first stragglers appeared the end of September. One was noted at Long Beach, Sept. 27, 1913.

"On Sept. 2, 1928, I observed a bird in spotty juvenal plumage at Mastic, L. I. (1928, Bird-Lore, XXX, p. 399). My Journal entry reads as follows: 'Observed a juvenal plumaged Great Black-backed Gull flying west to east along the beach, interesting on account of the date. Its large size, slow flight, whitish belly and rump and spotted plumage noticeable,—there can have been no mistake in identity.' I have assumed that this individual must have been a migrant, and noticed the correspondence in date with that of the appearance hereabouts of the first Herring Gulls in fresh juvenal plumage."

An all-day aërial survey from a navy hydroplane, flying over coastal Virginia and North Carolina on March 4, 1936, revealed the presence of a fair number of these

[1] Proc. Linnæan Society of New York, Nos. 45, 46, 1935, p. 92.

birds along the coast as far south as southern Pamlico Sound, North Carolina. Seven were seen in one flock near Cape Hatteras, and three in another near Ocracoke (N. C.). Single individuals or birds in flocks of Herring Gulls were noted near Manteo, N. C., and at various places throughout Pamlico Sound. These facts and reports from the New England and Canadian coast point to an unquestioned increase in the Black-backed Gull population along the American Atlantic coast.—Clarence Cottam, *Biol. Survey, Washington, D. C.*

**Snowy Owl in Virginia.**—On March 14, 1936, M. B. Newman, taxidermist of this city, showed me a Snowy Owl (*Nyctea nyctea*), in his collection which he had mounted. He stated that it was killed by a hunter, the latter part of November, 1934, about five miles from the city in Roanoke County.

As little is known of the occurrences of this specie in the state, I believe this record worthy of note.—A. O. English, *Roanoke, Va.*

**The Chuck-will's-widow in Maryland.**—While the Chuck-will's-widow (*Antrostomus carolinensis*) has been recorded as a breeding bird in St. Marys County, in southern Maryland by E. J. Court (Auk, 1921, p. 282) records for the state have been more or less casual. Kirkwood in his 'Birds of Maryland' (Maryland Acad. Sci., 1895, p. 314) records two seen near Odenton in July; Wetmore and Lincoln (Auk, 1931, p. 121) have recorded one near North Beach, Maryland; Clark and Forbes (Auk, 1932, p. 479) have noted one August 14, 1932, at Clements in St. Marys County; and S. E. Perkins, III (Auk, 1933, p. 368) has recorded a mounted specimen in the Cambridge High School taken near Fishing Creek in Dorchester County on the Eastern Shore of Maryland.

From my own observations of the past year it seems that this bird is a regular summer resident in fair numbers in suitable localities through the southern part of the state. On the evening of May 30, 1935, two miles south of Morganza, I heard two, and on June 15, two were calling steadily shortly after dark in second growth woodland near Cornfield Harbor. Three were noted simultaneously near Point Lookout June 25, and on July 14 at Morgantown the headlights of my car revealed one clearly as it rested beside the road while two others were heard nearby. On May 12, 1935, I recorded one near Laurel, which brings the species within the limits of the Washington region.

It appears that the Chuck-will's-widow is common in the southern part of the peninsula between the Potomac River and Chesapeake Bay, and that in lessrs number, perhaps irregularly, it extends north to the central part of the state in thie same region. Its northern limit on the Eastern Shore of Maryland has still to be ascertained.—Alexander Wetmore, *U. S. National Museum, Washington, D. C.*

**Sennett's Nighthawk in Ohio.**—The autumn Nighthawk migration reaches its peak in the Cleveland region during the last week of August and the first week of September. At certain times during this period, at favorable localities, particularly in river valleys, one may see hundreds of these birds in the air at one time. One such favorite locality is that part of Parma Heights, a suburb of Cleveland, which overlooks the valley of a branch of the Cuyahoga River. It was this locality which Mr. O. E. Mueller chose as a collecting station for Nighthawks during the autumn migration of 1934 and 1935 when it was decided to obtain a series of these birds for The Cleveland Museum of Natural History.

Five birds were taken during the last week of August and the first week of September in 1934, four of which turned out to be *Chordeiles minor minor* and one *Chordeiles minor sennetti*, the latter, an adult male, collected on August 31. In 1935 six birds

were secured during the first week of September, five of which were *Chordeiles minor minor* and one, a female, *Chordeiles minor sennetti*, shot on September 4. Thus out of eleven Nighthawks collected at random from passing flocks in two different years, two were the breeding form of the northern Great Plains region. It is not presumed that the proportion of Sennett's Nighthawks in flocks which migrate through Ohio is as high as this figure would indicate, but it does seem probable that this more western form, although previously unrecorded, is of somewhat regular occurrence in this state.

The identification of these specimens was corroborated by Dr. Harry C. Oberholser who considered the male bird a perfectly typical example of *Chordeiles minor sennetti*. —JOHN W. ALDRICH, *The Cleveland Museum Nat. Hist., Cleveland, Ohio.*

**Winter-killing of Flickers in Central Iowa.**—The Northern Flicker (*Colaptes auratus luteus*) occasionally winters in central and southern Iowa, with at least some apparent success.

During the past season of 1935–36, a winter of extraordinary severity, I had an excellent opportunity to follow the fortunes of a small group of birds that stationed themselves on an area I was keeping under observation north of Ames. These birds were commonly to be seen within three-quarters of a mile of a coniferous planting, adjacent to which were divers environmental types represented by a wooded creek, the outskirts of a residential district, corn fields, pasture, and a scattering of large trees and brushy and herbaceous growths.

I was unable to obtain what I considered a satisfactory count of the Flickers present in late fall, but there seemed to be three or four. Some of these, however, apparently had left by December 20, at which time we experienced the first sub-zero weather of the season, a minimum of −7° (F.) (U. S. Weather Bureau). More sub-zero temperatures occurred from December 24 to 27. There seemed to be two birds remaining, and these were seen from time to time during the next few weeks, feeding in a sumac thicket and in a corn field near-by.

Several inches of more or less crusted snow had accumulated by January 17, but there had been no sub-zero temperatures thus far in the month, the average daily minimum being 13°. On January 18, a cold wave arrived, and the minimum temperatures ranged from −3° to −26° for the duration of the month, with an average daily minimum of −15.8°.

On January 24, one Flicker was observed to make a flight from the vicinity of the conifers to a corn field some hundreds of yards distant. Its flight was labored, straight, and steady, without the characteristic flaps and dips. It passed within thirty yards of me, and I gained the impression that its feathers were standing peculiarly "on end," as feathers do on birds that are in poor condition. This was the last day that I saw a living Flicker until after the winter had broken.

The carcass of a Flicker which had been dead but a few hours was picked up in the afternoon of January 25. Crows had eaten the viscera and some of the flesh, but the breast contour suggested a dying weight of perhaps seventy-five to eighty percent of normal, or a little less than the degree of emaciation noted for winter-killed Mourning Doves in this locality (Paul L. Errington, Wilson Bull., 47: 159–160, 1935). Prior to death, the bird had done a great deal of fluttering over the snow in vain efforts to rise.

On the same day, very fresh feeding sign was to be seen in the corn field to which the one Flicker had flown on January 24. Subsequent indications were that this individual had managed to hold out for a few days longer, when it was killed by a Great Horned Owl. At the time of its death, its crop had contained sumac fruits (*Rhus glabra*).

A third Flicker carcass, eviscerated by small mammals, was discovered on April 6 at the bottom of the cavity of a large tree and in the position in which it doubtless had died. Its breast contour was about the same as that of the Flicker found starved on January 25, and it had the appearance of having died at about the same time. The hollow tree was more than half a mile from the coniferous planting, so I am not sure that this bird was one I had been watching.

Droppings were to be found scattered in the cornfields and in quantities at the base of certain trees. Approximately a quart of winter fecal material (271 grams, dry wt.) was gathered from beneath one tree, and of this a 75.2 g. random sample was examined. This upon analysis was found to be made up of: seeds and debris of sumac fruits, 64 g.; seed coats and partially digested kernels of corn, 7 g.; hackberry (*Celtis occidentalis*) seeds, 2.4 g.; Virginia creeper (*Psedera quinquefolia*) seeds, 0.4 g.; insect exoskeleton fragments, 1.4 g. Dr. H. H. Knight kindly checked over the insect remains, which proved to be almost entirely of the carpenter ant (*Camponotus herculeanus pennsylvanicus*) with single examples of Elateridae, Cucujidae (*Catagenus rufus*), and an undetermined bark-inhabiting beetle.

Insofar as sumac fruits are composed for the most part of hard seeds and other indigestible substances, the proportion of this item to corn and insects is considerably higher in the fecal contents than it was in the actual diets of the Flickers, but it is apparent that sumac was eaten in far larger amounts than anything else. The majority of the fecal passages, indeed, were made up exclusively of sumac debris, and these were commonly much more bulky than those representing chiefly the debris from the more completely digestible corn and insects.

While some individual fecal samples contained a mixture of items, the majority contained only the debris from a single food, indicating, as did observations in the field, that the birds tended to fill up rather exclusively upon what was convenient and swallowable where they happened to be feeding. Even the rarer items, such as *Psedera* seeds and insect chitin, were for the most part concentrated in relatively few fecal samples.

All in all, I would say that these wintering Flickers displayed a singular lack of adaptiveness in their feeding habits. Despite the fact that they experienced no evident difficulty in finding corn ears in the cornfields, nor in excavating considerable snow to get at them, this obviously superior food (seldom would corn debris other than seed coats pass through in the feces) would be wholly neglected, days in succession, for sumac fruits which happened to be more conveniently accessible and conspicuous. The freshest droppings for the week previous to the death of the one Flicker on January 25, and the sighting of another in miserable condition on the day before, consisted of practically nothing but sumac debris; the latter bird, according to the "sign," apparently had maintained itself on corn for the next few days, but at the time of its death had gone back to a sumac diet again.

W. L. McAtee (personal letter, April 8, 1936) suggests that, as 60 percent of the Flicker's normal food is animal, inability to obtain this sort of food might in itself place the bird under a serious handicap, regardless of the quantity of vegetable subsistence available.

So far as I know, Flickers were absent from this vicinity during the blizzard-ridden month of February, and the first evidence of their return was recorded on March 4. I have no information as to the northernmost points at which this species found the vicissitudes of the winter within its limits of tolerance.—Paul L. Errington, *Iowa State College, Ames, Iowa.*

**Southern Sharp-tailed Sparrow in Georgia and South Carolina.**—So far

as I have been able to determine, the Southern Sharp-tailed Sparrow (*Ammospiza c. diversa*) (Auk, 1901, p. 269; not recognized in A. O. U. Check List), has not previously been reported from Georgia or South Carolina. In a small series taken along the lower Savannah river, Arthur H. Howell has found six of this form. Two of these were taken in April and four in October, and there are specimens from both states.

Since then I have taken several others, and plus some sight records which should be correct within reasonable limits, believe that this subspecies winters regularly in moderate numbers in a particular type of low salt marsh, and perhaps over a much wider salt marsh range.—Ivan R. Tomkins, *U. S. dredge "Morgan," Savannah, Ga.*

**A Hybrid Flicker at Ottawa, Ontario.**—On May 12, 1936, while sketching Ducks and Geese in the Experimental Farm wildfowl enclosure I noticed two Flickers going through their courting antics in a clump of low bushes near-by. As I approached nearer to them I observed with the aid of binoculars that one was a male Hybrid Flicker.

When it turned towards me I saw that it had the pure red under tail surface of the western red-shafted form. In every other way it was the same as the eastern yellow-shafted form as far as I could see.

This is the most easterly record of the Hybrid Flicker in Canada. Two others were taken at Toronto Ontario, one is in the collection of Mr. E. T. Seton, the other is in the collection of Mr. G. E. Atkinson.—Arthur D. Nelles, *Ottawa, Ontario, Canada.*

**Nesting of Oncostoma in the Canal Zone.**—The genus *Oncostoma* Sclater is made up of but two species: the Bent-billed Flycatcher, *O. cinereigulare* (Sclater), which ranges from Mexico to western Panama, and the Lawrence's Bent-billed Flycatcher, *O. olivaceum* (Lawrence), which is found from the vicinity of the Panama Canal Zone southward to northern Colombia. These two are so closely allied as to be doubtfully specifically distinct, and Hellmayr (Catalogue of Birds of the Americas) considers *olivaceum* to be merely a subspecies of *cinereigulare*. It would seem therefore a fair presumption that there should be little difference in the nesting habits of the two birds.

A nest purporting to belong to *O. cinereigulare* is described by Carriker (An Annotated List of the Birds of Costa Rica, Annals of the Carnegie Museum, vi, 1909–1910, p. 733). It was found near Guapiles, Costa Rica, in a lime tree growing at the edge of a pasture. A pair of Bent-billed Flycatchers were around the nest when it was discovered, but no eggs had been laid. Several days later the site was again visited and the nest found abandoned and partially destroyed. Carriker describes this as "a tiny flattened cup-shaped structure, made of fine grasses and weed-fibers, and lined with vegetable down and a few hairs, and placed in a cluster of small branches on the top of a limb." It should be noted that the identification of this nest was based solely upon the fact that "the birds were around the nest" when he first discovered it. On the other hand, C. H. Lankester, of Cachi, Costa Rica, writes me that the structure is a "slender hang-nest of bottle shape."

As to *O. olivaceum*, I found a nest of this species along the Rio Indio trail, near Gatun, Canal Zone, on August 7, 1933. This was placed at a height of about three feet above the ground in a small bush in dense, scrubby jungle. It was near the trail and at the edge of a partial, tangled clearing which permitted plenty of light to enter the vicinity of the nest. It was a small, flask-shaped structure, about three inches in maximum diameter and a little over four inches in vertical length, hung from slender twigs. The entrance was a small round hole in one side near the top, with a "roof" projecting out and serving to shelter it. The nest was delicately yet very firmly

woven of plant fibres, fine weed stalks, and a little grass, and was so compactly built that it could not be seen through. When discovered it contained one very small white egg, approaching globular in shape, with a very few minute spots of red-brown about the larger end.

Quoting from my field-notes: "The parent, male or female, sat very close and being flushed from the nest flew off about twenty feet, alighted, and watched me as I stood by the nest. As I did not move, it appeared to summon courage and returned to perch about a foot below the nest and not more than two feet from me. It sat there quietly, turning its head and eyeing me gravely for at least a minute. It would not enter the nest, however, and finally flew off into the jungle."

"The nest was not visited again until August 15. For the second time the parent bird sat very close, but finally flew out. Before this the bird had extended its head and calmly looked me over. Examination showed two eggs, so almost certainly incubation had commenced. This time the bird sat about twenty feet from the nest, and was there, observing me quietly, when I left at the end of five minutes."

Dr. Alexander Skutch, a frequent contributor to 'The Auk,' has recently written me regarding the nest of this species, and I give the following extract from his letter. "It was an elongate, pensile structure, with a little round opening in one side, giving access to a rounded chamber in the lower portion. In form it rather resembled the nests of *Todirostrum cinereum*, but was much more neatly constructed, being composed almost entirely of the light-colored bast fibres taken from some disintegrating forest vine. It was hung about twelve or fourteen feet above the ground, from a slender twig of a small tree in the undergrowth of the forest, close by a little rivulet on Barro Colorado Island. When I first found it, which must have been about the end of April (1935), it contained no eggs, and I went back many times without being able to discover its owner.—After considerable delay, the two tiny white eggs (faintly speckled on the larger end with brown?) were laid, and I found the Bent-billed Flycatcher sitting on them. Sometimes she allowed me to climb the ladder until I was almost in reach of her before she flew out. She sat facing outward, like the Tody Flycatcher, Kiskadee and Giraud's Flycatcher, not tail outward, like the Royal Flycatcher. I never found more than one bird in the vicinity of the nest, even when I watched for several hours one morning from a blind."

A thorough examination of the literature on Central American birds fails to bring to light any description of the nesting of *Oncostoma olivaceum*, nor of *O. cinereigulare* save that of Carriker already cited.—David E. Harrowes, *Woodmere, N. Y.*

**Prairie Horned Lark (Otocoris alpestris praticola) Nesting in Baltimore Co., Maryland.**—A second record of the nesting of this species in Baltimore Co., was obtained through the finding of a nest containing two young birds, at Pikesville, April 19, 1936. While walking over a rolling meadow, the Lark flew up out of the grass with a dead fledgling in its beak; paving the way to the finding of its nest. A week later the young had left the nest but were noted in its near vicinity. Mr. F. C. Kirkwood found a nest containing eggs at Sweet Air, May 1935.—M. Brooke Meanley, *5111 Roland Ave., Baltimore, Md.*

**A Winter Food Supply for the Crow.**—Between December 22, 1935, and January 1, 1936, the writer has occasion to drive along about 1600 miles of highway, covering goodly portions of the states of Ohio, Kentucky, Tennessee, Arkansas, Missouri, Illinois, and Indiana. For more than three-fourths of this total distance the roads were snow-covered and ice-sheathed, and temperatures were below freezing. It was speedily noticed that the most consistently conspicuous bird along the high-

ways was the Eastern Crow (*Corvus b. brachyrhynchos*), and the impression grew that the birds were actually concentrated along the roads. The bodies of car-killed animals seemed to offer a reason.

Scores of crushed bodies of dogs, cats, and domestic chickens were noted. On a large percent of these Crows were observed to be feeding. The birds would simply move enough to allow a car to pass, and then re-settle to the food. Yet nowhere was a car-killed Crow observed.

In addition to the above animals, Crows were seen feeding on cottontails, one opossum, one small pig, and three skunks. One of the last named, a half eaten carcass, was examined. It had a strong odor, which the birds appeared not to mind.

The writer ventures the suggestion that this food source, consistent as it undoubtedly is, and available over a constantly increasing network of highways, may be having a definite effect on the ease with which the Crow is able to winter. It seems possible that it may even have an effect on the wintering range of this intelligent and adaptable bird.—Compton Crook, *Western Reserve University, Cleveland, Ohio.*

**Are Starlings a Menace to the Food Supply of Our Native Birds?**—Beginning with January 24, 1936, we had for five days in southern Louisiana, a most unusual spell of weather—cloudy with a northeast wind, and almost continuous drizzle, with the thermometer just about the freezing point. The precipitation was half sleet, half rain—sometimes quite hard.

Beginning January 26 there was on the 3,000 acres comprising the hills of Avery Island, the greatest concentration of small birds that I have ever seen. There had been since early Fall in this vicinity, enormous flocks of Starlings (*Sturnus vulgaris vulgaris*). These birds had been roosting in the sawgrass (*Clagium effusum*) around one of the lakes on the place, and in the more open cypress timber on the east side. They had been here all winter in flocks numbering hundreds of thousands. It was their custom in the early morning to leave their roosts and spread over the surrounding country, going as much as twenty-five to thirty miles north and west and feeding in the meadows and fields on seed.

There are on Avery Island about 1,500 acres of open land on which grows a thick mat of Lespedeza (*Lespedeza stricta*), together with many grasses. These growths produce a heavy seed crop which falls to the ground on the approach of frost and it is upon these seeds that the Starlings feed. They gather in compact flocks and crowd so close together, that the ground is completely covered. After the seed supply had been eliminated, the Starlings started ranging for their food to the high prairie lands, both open and cultivated, to the north and west coming back each night to roost at Avery Island. But few flocks had been seen feeding on Avery Island since the first of the year until January 28.

On January 26, one of the greatest waves of Robins (*Turdus migratorius migratorius*) and Cedar-Waxwings (*Bombycilla cedrorum*) that I have ever witnessed, came into the highlands of Avery Island. Literally hundreds of thousands of these birds arrived, all in one day, completely covering the trees on the place. They procured their food from the berry-bearing trees.

Two days later, the Starlings joined this great congregation and their number was unbelievable. They literally blackened the foliage and the ground when the great flocks alighted. They now were following the example of the Robins and Cedar-Waxwings, and were feeding on berries. The undergrowth of the place is made up largely of Cassena (*Ilex Vomitora*) and Holly (*Ilex opaca*). These trees were heavily covered with berries—so much so, that they seemed red instead of green when viewed from a distance. This is especially true of Vomitora. There are also great

numbers of Hackberry (*Celtis laevigata*), Camphor (*Cinnamomum Camphora*), and Chinaberry (*Melia azedarach*) trees growing on the Island, besides a number of other varieties of berry-bearing trees, shrubs and vines, all of which bore an unusual crop of berries this winter. I believe there would have been sufficient berries to have lasted even the enormous number of Robins and Cedar-Waxwings for at least four to five weeks, giving them an ample food supply. This has been about how long the berries on the Avery Island hills have lasted in past years when there have been similar flocks of Robins and Cedar Waxwings here.

I have never before seen Starlings eat berries, but this year following the example of the other birds, they evidently found the berries palatable, and joined the Robins and Waxwings at the feast. As the Starlings outnumbered the others by four to one, the combined birds completely stripped all the berry-bearing plants of their fruit in three days, and, as the food supply became exhausted, the great flocks passed on leaving only a few stragglers where there were thousands a few days ago.

On some of the Cassena-berry trees around my house, Starlings clustered so thickly that limbs of the trees were broken off, and others were bent until they became unshapely. I fired a single shot from a twenty gauge gun into a flock clustered in a Cassena-berry tree on the east side of my grounds. The result was 69 dead Starlings. The flock was so congested in this one tree, that nothing of the tree could be seen, and it looked as if the foliage was a mass of writhing birds.

Are not Starlings a menace to the food supply of our native birds?—E. A. McIlhenny, *Avery Island, La.*

**The Singing and Soaring Height of Sprague's Pipit.**—In a note in 'The Auk' for October, 1935, by Milton B. Trautman and Josselyn Van Tyne, entitled "The Occurrence of Sprague's Pipit in Michigan," exception is taken to the figures given, in 'Birds of Minnesota,' as to the usual height to which the Pipit rises while soaring and singing. While we were in the Red River Valley in 1928, where many of these birds were singing aloft, Mr. Breckenridge devised a rude adaptation of the usual triangulation method of determining elevations, and, with the aid of Mr. Kilgore, made a number of estimates that showed the approximate heights of the birds above the ground to range from 110 feet, as a minimum, to 325 feet, as a maximum. At the latter figure the tiny birds were almost invisible except with a strong glass and it seemed improbable that they could be detected at all at greater heights. Experiments made many years ago in Europe by attaching, to captive baloons, birds mounted as in flight, showed that a Sparrow Hawk was distinguishable at 800 feet, above which it became a mere spot (Lucanus in *Proceedings of the International Zoological Congress*, Berlin, 1901, pp. 410–418). How about a diminutive Pipit, under such conditions?—Thos. S. Roberts, *Museum of Natural History, University of Minnesota, Minneapolis, Minn.*

**A Georgia Specimen of Wayne's Marsh Wren.**—A single specimen of Wayne's marsh Wren (*Telmatodytes p. waynei*), from Oysterbed Island, Chatham County, Georgia, is offered for record. This specimen, male, October 1, 1932, bears my number 351, and was identified by Edward Von S. Dingle, who with Alexander Sprunt, Jr., described and named the subspecies (Auk, Oct. 1932, pp. 454–55).

Three others, two of which were identified by Dr. Harry C. Oberholser, and dated, October 8, 1933, February 6, 1932, September 21, 1935, respectively, have been taken from the same general area near the Savannah river mouth, but in South Carolina. These three agree closely with the Georgia specimen.

There doubtless are other Georgia specimens in the larger collections, perhaps

labeled *marianae*, as the two subspecies were confused with each other so long. Any such specimens will be of help in charting the range and migration of this dark form.—IVAN R. TOMKINS, *U. S. Dredge "Morgan," Savannah, Ga.*

**The Second Occurrence of the Ohio House Wren in Maryland.**—The Ohio House Wren (*Troglodytes domesticus baldwini* Oberholser)[1] has already been recorded from Washington, D. C., but the only published record of its certain occurrence in Maryland is that of an immature female taken by Dr. Alexander Wetmore[2] at Cornfield Harbor, near the mouth of the Potomac River, on October 27, 1935.

On May 12, 1936, the writer collected an adult male at Silver Spring, Maryland, one mile north of the District of Columbia boundary. The identification of this specimen was verified by Dr. Harry C. Oberholser.

This bird was in full song, and the gonads were considerably enlarged; yet, not withstanding this, it was doubtless a migrant, as the breeding House Wren of this region is the eastern race, *Troglodytes domesticus domesticus* (Wilson).—ALLEN J. DUVALL, *Biological Survey, Washington, D. C.*

**Eastern Mockingbird (Mimus polyglottos polyglottos) at Toronto, Ont.**—On November 8, 1935, I heard an unfamiliar note coming from the garden. It was an insistent *chip-chip-chip*. The bird could not be seen from the library but, on raising a blind in the bird-room, a bird flew from a honeysuckle vine outside the window. On going into the garden I found a Mockingbird and on examining it at close range decided it was a young bird already showing the effects of city smoke. At this date there had been no severe frost.

The bird was next seen on November 25, after a heavy frost, though there had been no snow. On January 1, 1936, there was snow on the ground and at 10 A.M. the Mockingbird appeared calling loudly, and accepted some currant-loaf put on the frozen surface of the bird bath. The bird was not seen again till the morning of February 12, when the thermometer registered 11° F. It was in good condition but its plumage had become a dark smoky gray. It again accepted currant-loaf but ignored chopped meat and dried currants.

On February 13, at 8 A.M., the thermometer was 11° F. with an east wind blowing, and a light snow was falling. The Mockingbird turned up at 9 A.M., and an hour later was caught and held by a howling easterly blizzard which prevented it leaving the protection afforded by the library walls. I had difficulty keeping the food shelf clear of snow. The bird ate currant-loaf freely; by 2 P.M. the blizzard had increased and there was evident difficulty on the bird's part in keeping clear of the snow and it had to shake itself free at intervals. At 2.30 P.M. I decided the Mockingbird could not last out the storm and, baiting a trap with a lettuce leaf, the bird was quickly secured and released in the conservatory. It was by no means exhausted and flew about without dashing against the glass; at 5 P.M., it was seen to fall to the floor and died soon afterwards. No doubt the sudden change from blizzard conditions was more than the bird could stand. Mr. Clifford Hope found it to be a female with granulated skull and it weighed 51 grams. After cleaning the plumage, signs of immaturity appeared.

There is one previous record of the Mockingbird for Toronto: one seen from November 20 to December 1, 1927, by Mr. Murray Speirs (Canadian Field Naturalist, 1931, p. 205).—J. H. FLEMING, *267 Rusholme Road, Toronto, Ontario.*

**European Goldfinch (Carduelis carduelis) in Wisconsin.**—On May 12,

[1] Ohio Journ. Sci., XXXIV, March, 1934, p. 90.
[2] The Auk, LIII, January, 1936, p. 86.

1935, Mr. John Patek described to me a bird he had seen the previous day in Riverside Park, Milwaukee. It was entirely different from any native bird with which I was acquainted. The song, he said, was like that of a Goldfinch. With this clew, I suspected an escaped cage bird. Going to the park, I found and collected the bird, which my father, a man not at all interested in ornithology, recognized as a "Stieglitz" or European Goldfinch. He had known the bird some fifty years before as a boy in Czecho-Slovakia. Subsequent identification proved he was right.

Inquiry has been made at most of the pet stores in Milwaukee and also at the Zoo if such a bird had escaped. None reported having had any of this species in their possession for a number of years.

The plumage of the bird when collected was quite sooty, indicating that it had not been caged recently. I therefore feel that this bird may be reported as an accidental straggler in Wisconsin.

The skin is now in the Milwaukee Public Museum.—Clarence S. Jung, *4612 N. Bahland Ave., Milwaukee, Wis.*

**Hoary Redpoll (Acanthis hornemanni exilipes) in New Hampshire.**—On January 12, 1936, while observing birds near the Connecticut River about four miles north of White River Junction, Vermont, I saw a single Hoary Redpoll in company with three Common Redpolls. The bird was an adult male, I believe, and was easily recognized.

Forbush cited one record for this bird from the state of Vermont in his 'Birds of Massachusetts' (vol. 3, p. 20), but to my knowledge there are no other definite records from the state.—William C. Vaughan, *Dartmouth College, Hanover, N. H.*

**The Cape Sable Sparrow and Hurricanes.**—At the southern end of the Florida mainland, between Cape Sable and the heavy mangrove forest that fringes the edge of the Everglades, lies a low ocean prairie extending in a narrow strip for twenty miles parallel to the coast. Scattered here and there over this area are large patches of switch grass, the home of the Cape Sable Seaside Sparrow (*Ammospiza mirabilis*). This species, peculiar to the Cape Sable prairie, is non-migratory, and remains in its limited range the year round, finding its food among the roots of the tall grass, and building its nest in some thick shady clump. But what happens when the awful hurricanes come? Where then do these little birds go? How can they survive?

On the second day of September, 1935, the most devastating hurricane ever recorded in this section swept over the entire range of the Cape Sable Sparrow. The low ocean prairie was completely covered with six feet of water, its surface lashed into great waves and spray by a gale of one hundred and thirty miles an hour. In the mangrove forests the trees that were large and not flexible enough to bend with the storm were torn to pieces; only the smaller ones, by bending to the water, escaped. Many large birds, Pelicans, Cormorants, Egrets, and Herons, which had gone to roost on the near-by keys were beaten down and killed. The Great White Herons suffered heavy loss. The storm continued throughout the night, leaving death and destruction in its path. Several human bodies from the Keys, thirty-five miles across the bay of Florida, were found after the storm, wedged in the mangroves that fringe the Cape Sable prairie. It is a wonder how this frail little Sparrow, with its weak, uncertain flight, could possible survive. But it did. In the ensuing month of April (1936) I found it again in the switchgrass, pursuing, manifestly, its normal, unbroken course of life.—John B. Semple, *Sewickley, Pennsylvania.*

**Harris's Sparrow again in Luce Co., Michigan.**—Since recording this species (*Zonotrichia querula*) near my home here (Auk, January, 1925 and July, 1932) in

spring, I have observed it several times in the autumn. Two on September 23, 1932, and one each on the following days: September 24 to October 1 and October 11, of the same year. I banded three which were in immature plumage and saw one adult that was not trapped. In 1933 I banded an adult on October 3 and saw another on the 30th.—Oscar McKinley Bryens, *McMillan, Luce Co., Mich.*

**Smith's and McCown's Longspurs Seen in Minnesota.**—On October 19, 1935, a flock of about one hundred Smith's Longspurs (*Calcarius pictus*) was seen on Minnesota Highway No. 3 about six miles east of Breckenridge. They were feeding along the roadside and drinking from a nearby ditch. They appeared to be very hungry and paid no attention to us as we sat in the car and studied them for twenty minutes or more. They exhibited a variety of plumages, some showing the distinctively marked head of the male in spring, and some displaying the white of the lesser wing coverts very prominently. All were more or less buffy on the underparts.

On the following day on U. S. Highway No. 210 three and one half miles south of Hassman, Minnesota, a mixed flock of Longspurs, Horned Larks, and Snow Buntings was studied for an hour at close range from the lee side of a haystack in the middle of a newly plowed field. Chestnut-collared Longspurs of both sexes and in all phases of fall plumage made up the bulk of the large flock. Among them two male McCown's Longspurs (*Rhynchophanes mccowni*), stood out sharply as something entirely different. The underparts were white; the black of crown, "moustache marks," and upper parts of the breast patch were still most evident, and contrasted strongly with the whitish underparts. The chestnut of the shoulders was discernible, but somewhat dull.

Mr. William Kilgore, Curator of the Museum of Natural History at the University of Minnesota writes, "Your Longspur records were of great interest to me. . . . [McCown's Longspur] as our records show disappeared from the state sometime about 1900 and has been considered a lost species so far as Minnesota was concerned. We have very little definite information about Smith's Longspur consisting of only a few early scattered records. Just why we have never found this bird during the spring and fall migrations has always been more or less of a puzzle to us."—Theodore Peterson and Mrs. Peterson, *Battle Creek, Michigan.*

**Observations on Some Newfoundland Birds.**—For nine days, July 28 to August 5, 1932, I studied the birds of Avalon Peninsula, Newfoundland. This peninsula forms the southeastern part of the island and is the section in which St. John's is located. Many short trips were made in the country surrounding this city, much time being spent in Bowring Park, and one or two trips being made some distance inland. One entire day was spent on "The Barrens" between Carbonear and Heart's Content. Since work and pleasure took me inland, rather than along the coast, little attention was given to the water birds. The list given herewith represents the more common land species.

*Gavia immer immer.* Common Loon.—One was observed flying high over the numerous ponds in "The Barrens" near Heart's Content.

*Botaurus lentiginosus.* American Bittern.—Just one bird of this species was observed. It was seen at Harbor Grace.

*Anas rubripes rubripes.* Red-legged Black Duck.—A flock of six was seen flying over a pond at Salmonier. While subspecific characters could not be distinguished at that distance, the birds were presumably of the "Red-legged" form.

*Pandion haliaetus carolinensis.* Osprey.—A beautiful bird of this species was noted at Placentia on August 5.

*Falco columbarius columbarius.* PIGEON HAWK.—Observed on two occasions. One was seen flying over the high hills near Heart's Content. As so many small birds were in the low trees and feeding on the berries and insects about "The Barrens" one may easily account for the presence of these small Hawks.

*Lagopus lagopus alleni.* ALLEN'S PTARMIGAN.

*Lagopus rupestris welchi.* WELCH'S PTARMIGAN.—Both species were reported to me as being present in berry-bearing shrubbery out in "The Barrens." A workman along the road told me of a hunter who killed one hundred and seventy Ptarmigan last fall (1931). Competent nature observers told me that both species are common in the bare lands that lie inland, and that they are 'holding their own.' Last season Ptarmigan sold in the markets of St. John's at sixty cents a brace. In August both species are said to be very elusive and are rarely seen at that season. I saw mounted specimens of both these species in a museum in St. John's.

*Capella delicata.* WILSON'S SNIPE.—Flushed a number of times from wet lands about the ponds. One day I saw one near Long Pond and observed it, at very close range, for a long time. It had been probing in the soft mud about the shore of the pond.

*Actitis macularia.* SPOTTED SANDPIPER.—Seen several times but not very common.

*Totanus melanoleucus.* GREATER YELLOW-LEGS.—One seen near Placentia standing at the edge of the water.

*Larus argentatus smithsonianus.* HERRING GULL.—Numbers were seen about the harbors and flying over the inland ponds. A former resident told me that, in former years, many of these larger Gulls were captured, fattened, and eaten by the fisher folk of Newfoundland. But, during the same period as that of my visit in that region, he found the practice almost abandoned. The Gulls are protected better than in former days.

*Megaceryle alcyon alcyon.* EASTERN BELTED KINGFISHER.—Several were seen fishing along a small stream that flows through Bowring Park. Appeared to be rather common.

*Colaptes auratus luteus.* NORTHERN FLICKER.—One building its nest at the entrance to a residence out a little distance from St. John's. Was excavating in some of the boards on August 1. I saw one in Bowring Park on one of the last days of July.

*Dryobates villosus terraenovae.* NEWFOUNDLAND WOODPECKER.—Two observed at Colinet excitedly flying about among the trees of that well-wooded region.

*Dryobates pubescens medianus.* NORTHERN DOWNY WOODPECKER.—As I walked along the stream in Bowring Park I saw one sitting on the trunk of a White Birch. This was the only one observed. It was a male in full plumage.

*Empidonax flaviventris.* YELLOW-BELLIED FLYCATCHER.—Out in a spruce forest near Three Pond Barrens I saw a pair of these little Flycatchers. In other places and on other days I heard the familiar softly whistled note of this species.

*Otocoris alpestris alpestris.* NORTHERN HORNED LARK.—On July 28, when I went out for my first bird trip, I found several of these birds on the top of Signal Hill. They were very much excited as I approached and evidently had young not far away. One was also noted on some very high rocky hills near Heart's Content.

*Iridoprocne bicolor.* TREE SWALLOW.—Eight or more birds of this species were observed one day flying over Long Pond. They were seen many times that day.

*Perisoreus canadensis sanfordi.* NEWFOUNDLAND JAY.—A number of these birds were seen in a dense evergreen forest at Salmonier. A wandering group of them came near to me and moved on leisurely through the trees. They are said to be common in the fir and spruce woodlands. As elsewhere they were very tame.

*Corvus brachyrhynchos brachyrhynchos.* EASTERN CROW.—I saw several Crows near St. John's and one day I picked up a feather of this species in a dense grove. Said to be rather common, though I saw only a few.

*Penthestes atricapillus atricapillus.* BLACK-CAPPED CHICKADEE.—A very common species. At any time I wished, when in wooded sections, I could call up a flock of these busy little birds.

*Penthestes hudsonicus littoralis.* ACADIAN CHICKADEE.—Like the preceding species this smaller bird was very common. The same 'squeak call' that attracted the Black-capped Chickadees so readily also attracted these beautiful little Chickadees. Usually the two species seemed to move about the trees together.

*Nannus hiemalis hiemalis.* EASTERN WINTER WREN.—One was seen on the day I watched the Newfoundland Jays in the evergreen forest at Salmonier.

*Turdus migratorius migratorius.* EASTERN ROBIN.—Very common wherever I went. I first saw them feeding on the pasture lands on Signal Hill; later I found them nesting at Bowring Park; then, far out in "The Barrens," I found them in considerable numbers. Said to remain over winter in Newfoundland. Out in some fields near Three Pond Barrens I found the Eastern Robins and the Fox Sparrows feeding in great numbers.

*Hylocichla guttata faxoni.* EASTERN HERMIT THRUSH.—Several seen. Close observation of a number of individuals left no doubt as to species.

*Corthylio calendula calendula.* EASTERN RUBY-CROWNED KINGLET.—Observed several times in the vicinity of St. John's. Seemed to be rather common in all evergreen woodlands.

*Anthus spinoletta rubescens.* AMERICAN PIPIT.—A half dozen or more were seen walking over the grass and the rocks on the great promontory at the entrance to St. John's Harbor. Some boys told me that they nested in the rocky places not far from the light-house.

*Dendroica aestiva aestiva.* EASTERN YELLOW WARBLER.—This Warbler is locally known as "Yellow-hammer." Quite common. Birds of this species were seen in most unexpected places. For instance, one was observed in a little clump of dwarfed trees far out in "The Barrens." A pair of these birds attracted my attention as I passed through a thick growth of spruces high up among the hills on the south side of St. John's. They seemed more like birds of remote forest sections than like the familiar birds of orchard and lawn as we commonly know them.

*Dendroica coronata.* MYRTLE WARBLER.—One male adult and several immature birds were seen among the trees along the stream that flows out from Long Pond. Not noted elsewhere.

*Dendroica striata.* BLACK-POLL WARBLER.—Very common; song heard hundreds of times. Old birds were seen feeding their young in Bowring Park. Out in "The Barrens" the Black-polls were common in the clumps of dwarfed spruces and firs. So far as I observed this was by far the most common Warbler in the region under observation.

*Seiurus noveboracensis noveboracensis.* NORTHERN WATER-THRUSH.—Several seen in Bowring Park and along various streams. Very tame. In one section these musical birds were still in song near the first of August.

*Setophaga ruticilla.* AMERICAN REDSTART.—Almost as common as the Black-polls. In Bowring Park they were particularly abundant, singing and feeding their young.

*Passer domesticus domesticus.* HOUSE OR ENGLISH SPARROW.—Much more common than this species is in many places in our own country. It seemed rather strange

to see them in the fields feeding in company with Fox Sparrows. Abundant in St. John's and common far out in the country.

*Euphagus carolinus.* Rusty Blackbird.—One family group, an adult male and four or five gray-brown birds (presumably the female and young), were seen on Long Pond, near St. John's. A few other small flocks were seen in several places on Avalon Peninsula. The light-colored eyes were always plainly visible. The birds were always noisy and excitable as I approached them. To a distress call, which I gave, they responded almost violently.

*Pinicola enucleator eschatosus.* Newfoundland Pine Grosbeak.—The Pine Grosbeaks were tame and would often come very near me, making, all the while, soft complaining notes of anxiety. I saw beautiful adults in the long narrow stretch of woodland near Long Pond.

*Acanthis linaria linaria.* Common Redpoll.—Very abundant in many places. Saw one rosy-red male singing in a small tree by the side of the road. Observed in many places. Eating seeds of elm in Bowring Park.

*Spinus pinus pinus.* Pine Siskin.—Many of these birds mingled freely and confusingly with the Redpolls as they fed on the myriad elm seeds in Bowring Park. Not observed elsewhere.

*Passerculus sandwichensis* subsp.? Savannah Sparrow.—Of more general distribution than any other species observed. Found in abundance in "The Barrens," out in old fields, along the streams, and in almost every other sort of place, the dense woods only excepted. Observed feeding young, and heard in song. Very tame.

*Junco hyemalis hyemalis.* Slate-colored Junco.—Not very common. I saw a small flock and heard the males singing at the edge of a forest out near "Three Pond Barrens."

*Zonotrichia albicollis.* White-throated Sparrow.—One was heard in full song in a woodland not far from the city. Not a common species. Observed in only one or two places.

*Passerella iliaca iliaca.* Fox Sparrow.—An abundant species; their large size and emphatic call-notes making them rather conspicuous. Familiar and friendly everywhere. In Bowring Park they hopped about in grassy places in much the same manner as that which the Eastern Robins have in more southern regions. The song of this bird was heard several times. Many young birds observed. Many Fox Sparrows seen out in "The Barrens."

*Melospiza lincolni lincolni.* Lincoln's Sparrow.—The first Lincoln's Sparrow was seen on the "South Side Hills" one morning and was watched for a long time through field glasses. On other days, to my great delight, I found many of these birds. Out in "The Barrens" they were abundant, tame, and friendly. I saw one sitting beside a Swamp Sparrow on a little limb. While sitting so close together the Lincoln's Sparrow received from the bill of the Swamp Sparrow a morsel of food of some sort in a most social manner. Only faint, lisping notes were heard from this species.

*Melospiza georgiana.* Swamp Sparrow.—Quite common in "The Barrens." A few seen in other places. Heard one singing its rather monotonous song. Apparently much less common than Lincoln's.—Earle Amos Brooks, *Boston University, Boston, Mass.*

**Further Remarks on Birds of Bolling Field, D. C.**—In 'The Auk' for October, 1935, p. 461, Dr. Titus Ulke records a single observation of several species of rare birds in the District of Columbia. An isolated occurrence is interesting but the value

of these records is greatly enhanced by the knowledge that some of the birds were noted over a more extended period by several observers.

The area in Anacostia, D. C., where these observations were made is known as "Bolling Field." It is a low, flat area, lying at the juncture of the Anacostia and Potomac Rivers, a great part of it consisting of filled-in land, a few patches of *Typha angustifolia* L. still remaining there. The area occupied by the birds is immediately southwest of the government flying field, and is in danger of being completely cleared for a projected extension of the landing field.

*Bartramia longicauda.* Upland Plover.—Robert Wallace, while investigating the Wren colony, flushed a pair of these Sandpipers, June 11, 1935. It has been many years since this species bred in the District, and this may mean an attempt at re-establishment. They were seen from June 15 until June 26 by W. Howard Ball and others, but no signs of nesting were noted. Of course, they still breed outside of the Washington area, in adjoining Maryland and Virginia.

*Otocoris alpestris praticola.* Prairie Horned Lark.—Aaron Stanton Rippey reported the presence of several birds in May and June, 1934. Phoebe Knappen and H. H. Collins, Jr. observed two adult Larks feeding a spotted young bird and flushed another juvenile Lark, on May 26, 1935. Guy Emerson and Ball saw three birds on June 2, which were repeatedly noted by the latter until June 26. On June 9 a young bird was captured, photographed, and released. It was being fed by an adult. The male was seen upon several occasions giving his flight song, during which the female remained upon the ground, walking about and picking up bits of material, but no signs of a nest were seen. These are the first breeding records for the District of Columbia.

*Cistothorus stellaris* (Naumann). Short-billed Marsh Wren.—On May 26, 1935, Knappen and Collins saw a Wren which was apparently nest building. A description of the area was given to Wallace, who succeeded in finding a colony on June 11, 1935, conservatively thought to contain six pairs. However, this was about half a mile west of where the first bird had been seen. On June 15, L. R. Porter, Wallace, and Ball made a search for nests. Wallace succeeded in locating a cock nest, eighteen and a half inches above the ground, which consisted of a globular, well-woven mass of sedges, *Carex* sp. No lining of any sort was present. These Wrens were seen until June 28. The nest was collected on June 26 by Ball and deposited in the U. S. National Museum. This is the first evidence of breeding in the District of Columbia.

*Spiza americana.* Dickcissel.—On June 20, H. Friedmann, N. C. Knappen, P. Knappen, and W. H. Ball were observing the Wrens mentioned above when a singing male Dickcissel was suddenly sighted, the first recorded in the District of Columbia since 1894. Singularly enough, it was just across the Anacostia River at the War College that the last previous record was made. This bird presumably was seen subsequently on June 21, 22, 23, 25, 26, and 28. He was timed on the morning of June 23, these figures showing what an incessant singer he was: 10:39½–10:40½, 9 times; 10:44–11:00, 140 times; 11:01–11:05½, 25 times; 11:08–11:10, 18 times. —W. Howard Ball, *Washington, D. C.* and Robert Browne Wallace, *Asheville, North Carolina.*

**Florida Records of Interest.**—In pursuance of the notes from Florida contributed to a recent 'Auk' by F. W. Loetscher, Jr., and myself, I would call attention to the following sight-records made by one of the best bird-students in the Connecticut Valley, Mr. Albert Dietrich, for whose experience and scrupulous accuracy I am happy to vouch, while on a birding-tour in Florida from Feb. 20 to March 7, 1936.

*Ardea occidentalis.* GREAT WHITE HERON.—Four, studied with a 40x telescope and perfectly identified by leg-color, thick-based bill, etc., on the Tamiami Trail (south side), February 27.

*Plegadis falcinellus.* GLOSSY IBIS.—Thirteen observed on Route 192, west of the St. Johns River, on March 4.

*Nyroca valisineria.* CANVASBACK.—Twenty-six seen on a small lake along Route 92, east of Lakeland, on February 29.

*Charadrius nivosus tenuirostris.* CUBAN SNOWY PLOVER.—Two identified so far up the east coast as Merritt's Island, on February 22.

*Haematopus palliatus.* AMERICAN OYSTER-CATCHER.—One at Point Pinellas on March 1.

*Larus marinus.* GREAT BLACK-BACKED GULL.—One on the ocean side of Merritt's Island, February 22.—SAMUEL A. ELIOT, JR., *Smith College, Northampton, Mass.*

**Notes from Southern Florida.**—From February 21 to 29, 1936, I had the opportunity of making a boat trip from Miami south around Cape Sable and up Shark River to a Heron roost just south of the Everglades. It seems worth while to record the following notes on estimated numbers of Herons actually observed, and other incidental observations.

*Gavia immer immer.* COMMON LOON.—February 23, one just east of Sand Key; February 28, one at Anglefish Creek.

*Ardea occidentalis.* GREAT WHITE HERON.—About 12 on mud banks just north of Craig; some 35 in Shark River roost; eight or nine in the air along the Gulf coast; and three or four about Anglefish Key; also three Würdemann's Herons in the Shark River roost, yellow-legged like the Great Whites.

*Ardea herodias* subsp. GREAT BLUE HERON.—Biscayne Bay, one; Shark River, two; Craig, one; Anglefish Creek, one.

*Casmerodius albus egretta.* EGRET.—Only one seen, on Florida keys in vicinity of Craig.

*Egretta thula thula.* SNOWY HERON (locally "Golden Slippers").—Particularly common, flocks of as many as fifteen encountered among mangroves of Shark River. About 100 individuals at roosting grounds.

*Hydranassa tricolor ruficollis.* LOUISIANA HERON.—Common everywhere; flocks of from five to thirty-five encountered in Shark River; several flocks of 200 or 300 at roosting area.

*Florida caerulea caerulea.* LITTLE BLUE HERON.—Occasional individuals associating with Louisiana Heron; only three or four white immatures.

*Butorides virescens virescens.* GREEN HERON.—One solitary individual at Shark River, February 25.

*Nycticorax nycticorax hoactli.* BLACK-CROWNED NIGHT HERON.—One at Miami; common at Shark River.

*Mycteria americana.* WOOD IBIS.—Common at Shark River; estimated 200 individuals in roosting area in flocks of about thirty each.

*Guara alba.* WHITE IBIS.—Abundant at Shark River; roosting flock estimated at 1000.

*Aix sponsa.* WOOD DUCK.—One pair in vicinity of Shark River rookery, February 24.

*Glaucionetta clangula americana.* AMERICAN GOLDEN-EYE.—Five at south end of Biscayne Bay, February 22.

*Coragyps atratus atratus.* BLACK VULTURE.—Occasional throughout trip (except on keys); most common in Shark River where there were one-third as many as Turkey Buzzards.

*Falco peregrinus anatum.* Duck Hawk.—One on keys, vicinity of Craig, February 26.

*Larus delawarensis.* Ring-billed Gull.—One adult, Anglefish Key, February 27.

*Corvus ossifragus.* Fish Crow.—One heard at Shark River.—D. G. Nichols, *Garden City, N. Y.*

**Late Nesting Records for Northern Illinois.**—The following observations were made by the writer in the vicinity of Ottawa, LaSalle County, Illinois.

*Colinus virginianus virginianus.* Bobwhite.—A nest of this species, containing eleven eggs, was found by a highway maintenance worker 10 miles north of Ottawa, Illinois, Sept. 8, 1933, and the female was still incubating when the nest was shown to me on Sept. 14.

*Gallinula chloropus cachinnans.* Florida Gallinule.—A Florida Gallinule's nest, containing two eggs and two recently hatched young, was discovered August 16, 1935.

*Spiza americana.* Dickcissel.—On August 28, 1935, I observed two Dickcissels carrying food into one particular portion of a hemp field; a search failed to reveal the nest. For the next several days they continued to carry food, but it was September 4, before I found a young Dickcissel scarcely able to fly ten feet. This seems to be an exceedingly late nesting date for this species in northern Illinois.

*Ammodramus savannarum australis.* Eastern Grasshopper Sparrow.—Two nests of this species were found in an oat stubble field, overgrown with sweet clover and morning glories, August 29, 1935. One contained partly fledged young, and the other, four slightly incubated eggs. The nest containing the eggs was deserted by the adult on September 6.—Frank Bellrose, *Ottawa, Illinois.*

**Notes from North Central Illinois.**—The following observations were made by the writer along the Illinois River within twelve miles of Ottawa, LaSalle County, Illinois.

*Clangula hyemalias.* Old Squaw.—Since in Illinois this species occurs only infrequently away from Lake Michigan, I here record a female seen by the writer and C. T. Black, December 3, 1935, on the Illinois River.

*Aquila crysaetos canadensis.* Golden Eagle.—An immature of this species was observed, with 8x binoculars, for fully a half hour in the western part of Starved Rock State Park on December 27, 1934. This majestic bird performed several surprising aerial maneuvers, for as it was sailing approximately 100 feet overhead, it suddenly darted upwards, turned over, and swept downward, somewhat after the manner of a Flycatcher. This was repeated a number of times.

*Falco peregrinus anatum.* Duck Hawk.—On September 10, 1935, a fast flying individual in immature plumage darted over some cattails, bordering an area of mud flats, down upon a company of Killdeers, taking chase to an individual until lost to sight.

*Charadrius melodus.* Piping Plover.—While this species is commonly found along the shores of Lake Michigan, it does not regularly occur in the interior of this state, and therefore I think it worthy of recording a flock of six seen near the Starved Rock Dam, July 19, 1935.

*Tyto alba pratincola.* Barn Owl.—A nest of this species was found in a sandstone cliff on July 2, 1935, which contained four downy young; they remained until August 5, 1935.

*Vireo belli belli.* Bell's Vireo.—A Bell's Vireo's nest was discovered two and one-half feet above the ground in an elder-willow thicket on June 22, 1935. At that time the nest contained three young; several good photographs of the adults feeding the fledglings were secured.—Frank Bellrose, *Ottawa, Illinois.*

**Some Notes from Arkansas.**—*Gavia immer immer.* Common Loon.—In 'The Auk,' LII, 324, I reported one seen on the St. Francis River in eastern Arkansas. Oct. 5, 1935, while in a motor boat on Lake Hamilton in Garland County, six miles from Hot Springs National Park, I sighted one which dived when I was within about 150 yards. Though I circled the region for half an hour it was not seen again. While in a blind on October 11 I watched a Loon for nearly an hour through 8x binoculars and a 25x telescope. It was swimming well out from shore. An attempt was made to get nearer in a motor boat but the bird dived and was lost sight of. Oct. 26 two Loons were sighted swimming together, both diving at my approach. One was lost sight of but the other reappeared fully 300 yards distant. It dived again as I came closer and was finally seen fully half a mile away. This time I was able to get close enough to shoot it. The bird weighed exactly 5 lbs. after bleeding freely and on dissection proved to be a female. Nov. 4, 1935, approaching Gilliam's Landing in a motor boat, a Loon was seen swimming within fifty yards of the dock. It dived but as I entered the boat-house it reappeared and swam leisurely down the Lake. On Nov. 8 two were sighted near a house-boat in the Lake.

*Columbus auritus.* Horned Grebe.—Apparently not reported from this state since Pindar recorded those observed in the winter of 1888–89. I collected one, a male, October 15, 1935, on Lake Hamilton. It was feeding with six small Ducks, apparently Ring-necks.

*Pelecanus erythrorhynchos.* White Pelican.—A flock of fifty-five was seen on Lake Hamilton, May 25, 1932. They flew up and down the Lake for about half an hour just before dusk and finally settled on the water.

*Charitonetta albeola.* Bufflehead.—Probably commoner than the few reports indicate. On November 17, 1935, while in a blind on Lake Hamilton, two females were observed at close range, at times within fifty yards, for about half an hour, through 8x binoculars. When first seen they were in company with seven Ring-necked Ducks but their diving soon separated them from the latter. They frequently dived in unison and emerged within a short distance of each other.

*Mergus serrator.* Red-breasted Merganser.—Reported only from Poinsett County in this state. While on a house-boat at Whitehall Landing in Lee County from November 13 to December 14, 1933, these Mergansers were common in a slough just off the Mississippi River. They would frequently feed within a hundred yards or more from the boat. Two were brought to me by hunters. Nov. 14, 1935, I saw a pair swimming about 300 yards off shore in Lake Hamilton. Nov. 15 there was a flight of thirteen and another of seven near the same locality. One, a female, was collected. On November 19 a flock of ten was seen about a mile from this location.

*Haliaeetus leucocephalus leucocephalus.* Southern Bald Eagle.—On October 26, 1935, two were sighted perched on the top branches of a tall dead tree on the north side of Goat Island in Lake Hamilton. One was in full adult plumage, the other immature without a vestige of white. As I passed in a motor boat about 150 yards distant the adult took flight and circled in the distance. The young was still on its perch when last seen. On October 28 an immature bird was circling near a Turkey Vulture. Apparently keeping their same relative distance they manoeuvered nearly across the dome of the sky. Oct. 29 an Eagle in immature plumage was seen soaring over the north side of Goat Island near where the pair was seen October 26. On November 4 two were observed circling to the south of Goat Island. One was an adult, the other too far away to determine. Nov. 6 an immature bird was perched on the top of a dead tree about twenty-five feet high, where I have frequently seen an Osprey sitting. On November 14 I saw two, one adult and one immature on this tree.

*Pandion haliaetus carolinensis.* OSPREY.—A spring and fall migrant at Lake Hamilton. In the spring it is seen in May. In the late summer and fall it was observed this year, 1935, from August 19 to October 26, most frequently from September 24 on. I made very few trips to the Lake during this period that I did not see one or more, four being seen during one visit.

*Totanus melanoleucus.* GREATER YELLOW-LEGS.—A single specimen was closely observed on Lake Hamilton September 5, 1935. It was feeding on a bare rocky point and allowed me to approach within thirty yards.

*Totanus flavipes.* LESSER YELLOW-LEGS.—A specimen was collected on Lake Hamilton, September 23, 1935. It was feeding on a gravel beach at the water's edge and was alone. There are only two records from Arkansas, one from Monticello, April 13, 1909, the other from Stuttgart, May 14, 1910.

*Sterna hirundo hirundo.* COMMON TERN.—A specimen collected by me in eastern Arkansas was reported in 'The Auk,' LII, 324, which was apparently the first record from the state. September 10, 1935, a pair was seen on Lake Hamilton and one was killed.

*Hydroprogne caspia imperator.* CASPIAN TERN.—I reported in 'The Auk,' LII, 324, the first specimen recorded in the state. Sept. 12, 1935, while on Lake Hamilton I collected one from a flight of seven and a flock of about the same size could be sighted in the distance. September 20, nine were seen and September 23, seven. Sept. 24 there were two pairs on the Lake. One pair was resting on a bar with a large Gull and a Little Blue Heron in the white phase. A pair was seen September 27 and eight on September 28. One was seen to dive from an altitude of at least fifty feet, remain under water for several seconds and emerge with a fish about six inches long.

*Vireo solitarius solitarius.* BLUE-HEADED VIREO.—The only reports from this state are from Winslow and Delight, both fall records. On November 1, 1935, I collected one, a male, in this county. It was feeding in a low patch of briars about 150 yards from a trunk highway and was alone.

*Vermivora celata celata.* ORANGE-CROWNED WARBLER.—Never recorded from this state. On October 10, 1935, I killed a specimen in my back yard on the edge of the city of Hot Springs National Park. The species was observed regularly from September 11 to October 17. All were in immature plumage. Two were seen October 16 and again the following day hence it is obvious that there were at least three feeding on the place. They were seen at various times in a very tall black gum tree, a large white oak, a small hickory and, most frequently, in the weeds and small shrubbery in the uncultivated garden. These records have two interesting features. First, the birds were observed over a period of 36 days whereas no other transient Warblers remain in this section nearly that long. Secondly, they were seen frequently during this time in a narrowly circumscribed area but not found in any other locality though 26 field trips were made during these 36 days. The identification of the skin was kindly made for me by Dr. Friedmann of the U. S. National Museum.—WILLIAM H. DEADERICK, *36 Circle Drive, Hot Springs, Ark.*

**New Records for the Puerto Rican Avifauna.**—At Guanica Saline, on June 16, 1935, I obtained a male Mourning Dove (*Zenaidura macroura macroura*), in full plumage. Flying in a flock of about twenty of the common Doves of this country (*Zenaida aurita zenaida*), his long, slender tail, and rapid, soft flight made me believe he was a different species. The specimen was collected and is still preserved alive as the shot only broke the tip of the right wing.

On December 28, 1935, at Guanica Lagoon, I obtained a male specimen of the Red-legged Black Duck (*Anas rubripes rubripes*). He was in full winter plumage

flying with some Blue-winged Teals (*Querquedula discors*) and some Bahama Pintails (*Dafila bahamensis bahamensis*) and was conspicuous because of his very large size and dark color. He was collected by Mr. Rafael Sauri, Jr. and presented to me by him.

At Anegado Lagoon, on December 12, 1935, I collected a female specimen of the Glossy Ibis or "Black Curlew" (*Plegadis falcinellus falcinellus*) in full plumage. She was flying above a shallow marsh together with eleven other individuals. I noticed that their flight is more rapid than that of Herons and Egrets. I confused them with Egrets until I noticed their larger size and curved bill. This was the first time I ever saw the Glossy Ibis in this country although records of its occurrence are many. Dr. Danforth had the opportunity of collecting two birds after my experience. —VENTURA BARNES, JR., *Mayaguez Station of the United States Department of Agriculture, Mayaguez, Puerto Rico.*

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**Errata.**—On page 237 of the April 'Auk,' in the verse quoted from Fuertes, "*so* more to see" should, of course, read "no more to see"; while on p. 248 an unfortunate error has resulted in an entirely wrong statement as to the numbers of Gannets. It should read "66,000 in the British Isles and Iceland and 12,000 in Canada."—Ed.

## RECENT LITERATURE.

**Pettingill on the American Woodcock.**—Among the notable monographs dealing with a single species of bird will stand that on the American Woodcock by Olin Sewall Pettingill, Jr., which has just been published by the Boston Society of Natural History.[1] This work is an excellent example of what may be accomplished by a concentration of effort upon one subject or area in contrast to the superficial skimming over a wide range of both birds and ornithology that seems characteristic of too many present day bird students bent upon the recording of a long daily list!

Our author began his study when a college undergraduate in 1928, presented the results as a thesis for the degree of Doctor of Philosophy in 1933, and now has brought his monograph up to date. He has given the literature of the Woodcock an exhaustive study and embodied the most important items in his work together with much additional information contributed by many correspondents and his own invaluable personal studies of the bird. The results are presented under three headings: The Bird; The Life History; The Struggle for Existence.

Under the first are discussed the early history of the Woodcock, its technical and common names, its description including tables of measurements and weights and extending to plumages, molts, pterylosis and osteology, its food and feeding habits, its flight and voice, and a detailed account of its distribution and abundance by states and provinces.

Under Life History are considered the spring migration, breeding territory and courtship, mating, nesting, activities of the young and fall migration.

As to its struggle for existence Dr. Pettingill, after a study of the reports submitted by the Game Departments of the various states, concludes that "unless certain radical conservation measures are enacted at once it will be only a matter of years before the species will be lost to us."

It is absolutely essential that more protection be given in order that it may regain enough of its former numbers to withstand any disaster that might occur and thus be reduced to a hopeless few.

This brief summary will indicate the thoroughness of Dr. Pettingill's study but lack of space compels us to limit our comments to but a few of the interesting points that he has brought out. With regard to the long debated question as to how the whistle of the flying Woodcock is produced our author quotes most of the published accounts and concludes with his personal observations. When he reached into a covered box in which a wounded Woodcock was confined the bird uttered several alarm notes of the same pitch and quality as the well known whistle which notes must have been vocal. On the other hand a bird kept in an aviary where it could fly for short distances continually produced the whistle when on the wing but after the three attenuated primary feathers, supposed to be concerned with the whistling, were cut off the sound was no longer produced. Dr. Pettingill therefore concludes that the sound may be made both vocally and mechanically, but evidently regards the latter as the usual method.

With regard to the equally moot question as to whether the Woodcock carries its young between its legs Dr. Pettingill dismisses a number of the accounts as misinterpretations but considers that others are reliable. He, however, does not con-

[1] Memoirs of the Boston Society of Natural History. Volume 9, Number 2. The American Woodcock *Philohela minor* (Gmelin). By Olin Sewall Pettingill, Jr. with ten plates. Boston: Printed for the Society. April, 1936. Pp. 167–391, Ppl. 13–21. Price $3.50 in paper; $4.75 bound.

sider that the bird intentionally carries its young in flight but rather that a brooding bird, crouching closer on the approach of danger gets one of the young between its thighs and, flushing in the stiff legged position of the "injury-feigning" flight, lifts the young and carries it for a short distance. The "heavy" flight often cited as evidence that the bird was carrying some burden is merely a part of the "injury-feigning" performance. The latter by the way is attributed, as suggested by Dr. Herbert Friedman, to a conflict of fear and love of nest and young, and not the result of instinct or intelligence in an effort to lead an intruder away from the spot.

Dr. Pettingill finds that the male Woodcock has a domain that is divided into a wooded or brushy feeding area where it spends the day, and an open singing field to which it resorts at evening for its courtship performances. The female seeks the male on the singing field but her nesting area is usually at some distance and is rarely visited by the male who takes no part in the nest building or care of the young. Several females have been found together on the singing field which suggests, with reasonable probability, that the Woodcock "is at times at least polygamous." This seeking of the male by the female on his singing field recalls the similar action of gallinaceous birds which are notoriously polygamous and curiously enough the author's observations on the feeding habits of the young which accompany the female and are assisted by her in obtaining food, are also reminiscent of the gallinaceous birds.

Dr. Pettingill spent a few days during two autumns at Cape May Point, N. J., to observe the concentrated migration of the Woodcock but apparently did not witness a typical flight when the birds come in off the ocean in vast numbers having been blown off shore by the north-west winds. He does not adequately describe the enormous numbers of the birds that are killed by gunners on these occasions nor the difficulty of enforcing either bag or season limits when the entire community is in sympathy with the gunners who cannot withstand the temptation for slaughter which has been their privilege for time immemorial. We are confident that more Woodcock are killed at a few such strategic spots than in all the rest of the country combined and unless shooting there is stopped entirely the Woodcock is doomed.

Local gunners and wardens alike will insist that the Woodcock is as plentiful as ever partly because they really think so, not realizing that the congested flights represent not local birds but the entire Woodcock crop of the east; and partly because they dread more restrictions if they admit that the birds are decreasing.

Dr. Pettingill has given us a splendid summary of the Woodcock and its life history and let us hope has also shown the need of immediate action if this unique and interesting bird is to be saved from extermination.

A good bibliography and many interesting photographs of Woodcock and Woodcock haunts together with an excellent color plate by Sutton complete the monograph, which is well printed and free from typographical errors except that the name of Robert Ridgway is consistently misspelled.—W. S.

**van Rossem on Birds of the Charleston Mountains, Nevada.**[1]—As is generally known Mr. van Rossem has made a number of trips to these interesting mountains in southern Nevada, which rise abruptly from a 3,000 ft. desert to an altitude of 12,000 ft., and in the present paper presents a study of the avifauna and its relationships. We have already noticed his publication of four new forms peculiar to the range.

[1] Cooper Ornithological Club Pacific Coast Avifauna Number 24. Birds of the Charleston Mountains, Nevada. By A. J. van Rossem. San Diego Society of Natural History, Berkeley, California. Published by the Club. May 1, 1936. Pp. 1–65.

Only seventy-eight residents and summer residents have been found in the range and the nearby Sheep Mountains from which a few specimens were obtained. Of the fifty-three species and subspecies found in the Upper Sonoran or higher zones, thirty-seven are of general western or Great Basin distribution, eleven are similar, or most closely related, to races of the Inyo region to the westward, while eleven have closest relation to Rocky Mountain forms. There is no instance of a Sierran or trans-Sierran identity except for four wide ranging species.

The author discusses the physical features of the range with illustrations of characteristic scenery, following which is a well annotated list of the birds. Isolated ranges such as the Charlestons are always interesting in their faunal relationships and Mr. van Rossem has done an excellent piece of field work in making the explorations upon which his report is based.—W. S.

**Books on British Birds.**—We recently had the pleasure of reviewing Turner's 'Every Garden a Bird Sanctuary' the first of Witherby's 'Bird Lovers' Manuals,' and now we have before us two additional volumes of this series of popular books on the birds of Old England.

Norman H. Joy presents a handy field book[1] 'How to Know the British Birds,' somewhat after the fashion of Peterson's 'A Field Guide to the Birds [of N. America].' There are two series of illustrations one from pencil sketches showing the birds in their most characteristic attitudes; the other figures in color of the most strikingly marked species. The several orders of British birds are then distinguished on the basis of characteristic species following which are brief descriptions of the species in which field characters, size, distribution and nests are considered. While there are no "keys" the necessary information is clearly presented and the most important points italicized. Dr. Joy very properly emphasizes shape and action rather than color as it is upon these that the trained bird student learns to rely for, in many cases, owing to poor position or light conditions, color cannot be satisfactorily determined. This little book cannot but prove of great assistance to the beginner whose aim is to know his birds, as well as to the visitor from other lands who would make acquaintance with the English species.

Another delightful little volume[2] in the same series is R. M. Lockley's 'Birds of the Green Belt' pointing out what birds may be seen in the environs of London and describing their haunts with many interesting allusions to other forms of life, both animal and plant, and much historical data on the regions described. Besides being a storehouse of local items of natural history the book is a fine piece of English composition and will be read with interest by many not especially devoted to science. The author is a true nature lover as is shown by his appreciation of other fields than his own, when he replies to a friend's query as to how he can "get a kick out of birds"; "A kick of that sort," he replies, "can even be got out of a study of snails if you are keen enough."

Mr. Lockley's book will also prove invaluable to the tourist as well as to the city resident who would become better acquainted with the rural surroundings of the great city and their wild life.—W. S.

**Brooks' Plates of North American Birds.**—'The National Geographic Magazine'[3] has issued two installments of the plates of North American birds being

[1] How to Know the Birds. By Norman H. Joy. Pp. 1–136; Ppl. 1–40. March 17, 1936. H. F. & G. Witherby, 326 High Holborn, London. Price 5 shillings net.

[2] Birds of the Green Belt. By R. M. Lockley. Pp. 1–236, several half-tone plates and numerous text-figures. April 2, 1936. H. F. & G. Witherby, 326 High Holborn, London. Price 5 shillings.

[3] National Geographic Magazine for April and June, 1936.

prepared by Major Allan Brooks. The first covers the Thrushes, Thrashers and Swallows with text by T. Gilbert Pearson and the second the Parrots, Kingfishers and Flycatchers [although Cuckoos and the Trogon are included] with text by Alexander Wetmore.

The color plates represent the usual fine work of the artist and the color reproduction is good although the Mockingbird seems a bit too blue. Many interesting photographs are presented in the text most striking of which is a large group of Cliff Swallows' nests photographed near Colorado Springs by Myra Keen.

All of the land birds, except the Sparrows, Warblers, Woodpeckers and Gallinaceous species have, we believe, now been covered as well as the Herons and their allies, making a remarkable series of bird portraits.—W. S.

**Nissen's Schöne Vogelbücher.**—In a well-planned little book[1] Dr. Claus Nissen has recorded the development of ornithological illustration from the Middle Ages to the present.

The first section of the volume is devoted to a chronological account of important illustrated bird publications with reference to the scientific accuracy of the figures, methods of reproduction, artistic qualities, etc. Next comes a list of 554 works on natural history arranged alphabetically by authors and giving the illustrators and the nature of their work. A list of artists, engravers, and colorists follows. The whole is cross-referenced so that knowing a given artist one can find wherein his work appears, or knowing an author one can find his illustrators. The remainder of the book consists of reproductions of bird illustrations dating from 1485 up to and including a selection from the various works of Gould.

The author states (p. 25) that it is to be regretted that other countries have not followed the American trend in reproducing plates separately, as well as with text, and that today we are about as far as ever from having readily accessible bird illustrations covering the whole field. He adds that photography cannot replace the careful and detailed work of the artist, so long as faithful color reproduction is not solved completely; nevertheless, the sphere of application of the artist is narrowing because of the superiority of the camera in recording animals in action.

This little volume will appeal to those interested in bird illustration, particularly because of the bibliography it contains. Unfortunately, it is printed in a very limited edition.— R. S. P.

**Systematic Catalogue of the Birds of Argentina.**—As part of the memorial volume on the fiftieth anniversary of the founding of the Museo de la Plata Messrs. Alfredo Steullet and Enrique A. Deautier have prepared a systematic catalogue of the birds of Argentina[2] the first part of which has just been received. This comprises a detailed review of Argentine ornithology and the systematic list from the Rheidae to the Steganopodes inclusive, in the order of Wetmore's classification.

Under each species and subspecies there is a full synonymy so far as the region covered is concerned and paragraphs on material examined, geographic distribution as well as frequent critical notes and an explanation of the etymology of all technical names by Dr. Jorge Casares. Acknowledgements for assistance are also made to Dr. Roberto Dabbne. The work will prove of great assistance to all students of the birds of southern South America.—W. S.

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[1] Schöne Vogelbücher, Ein Überblick der Ornithologischen Illustration nebst Bibliographie, von Claus Nissen, Herbert Reichner Verlag, Vienna, 1936. Pp. 1–95. [From Philobiblon, VIII, 1935, pp. 23–40, 69–90, 123–136, 169–180, 225–234, 435–444.] Price 5 marks.

[2] Catalogo Sistematico de las Aves de la Republica Argentina por Alfredo B. Steullet y Enrique A. Deautier. Obra del Cincuentenario del Museo de la Plata. Tomo I Primera entrega. Buenos Aires Imprenta y Casa Editora "Coni.," 684 Calle, Perú. 1935. Pp. 1–256.

**Taka-Tsukasa's 'The Birds of Nippon.'**[1]—The fifth part of Volume I of this handsome work is before us, continuing the Bibliography and the Gallinaceous birds. *Tetrastes bonasia, Falcipennis falcipennis, Tetrao urogallus* and *Lyrurus tetras* are considered in this installment. There are two color plates and several photogravures of habitats. The notable excellence of paper and typography of the work is fully maintained.—W. S.

**Pinto on the Birds of Goyaz.**—This publication[2] is a report on a collection of birds made by the author on an expedition through the southern parts of the state of Goyaz, Brazil, during the year 1934. A brief revue of ornithological work in the state and an itinerary illustrated by several photographs of scenery is followed by a comparative list of the birds found on the Rio des Almas and at Inhumas and a well annotated list of the collection numbering 261 species. Of these the following are described as new: *Conopophaga lineata hellmayri* (p. 81), *Synallaxis brachyura jaraguana* (p. 89), *Cranioleuca semicinerea giyana* (p. 91) *Ostinops decumanus australis* (p. 149), all from the vicinity of the Rio das Almas.

**Proceedings of the Linnaean Society of New York.**[3]—The latest number of the Linnaean Society Proceedings presents as a frontispiece a portrait of one of its most active members the late Warren F. Eaton and very fittingly the major part of the brochure is devoted to his account of the Birds of Essex and Hudson Counties, New Jersey, an excellent contribution to our knowledge of the ornithology of that portion of the state.

Charles A. Urner presents a further analysis of the shore-bird flight on the Jersey coast covering the years 1932 to 1934.

Walter Sedwitz has a list of Half-hardy Birds that Wintered through 1933–1934 in the New York City Region and Joseph J. Hickey a review of the year 1934 in the same region.

The publication speaks well for the activity of the Society and the keenness of its members.—W. S.

**School Bulletin of the University of the State of New York.**—The Bird Day issue of this publication contains a notable series of ornithological articles.

The Uses of Bird Sound Photography. By A. R. Brand.

The Hermit Thrush. By A. A. Saunders.

In Warbler Time. By Guy A. Bailey.

How Fast Does a Barn Swallow Grow? By Dayton Stoner.

The Eastern Least Bittern. By Allen Frost.

The Rise and Fall of a Tern Colony. By Roy Latham.

In Quest of the Piping Plover at Sandy Point. By Hazel R. Ellis.

Also papers on Duck Hawk, Gulls, Yellow Warbler and Cowbird, Bird-banding, Bird Sanctuaries, etc., all well illustrated. Such a publication should prove a great aid to bird education and conservation.—W. S.

**Framing the Birds of Prey.**—Davis Quinn of the Emergency Conservation Committee has prepared a new edition of the pamphlet on Hawk preservation issued several years ago. The present edition has been greatly revised and improved and the whole subject of Hawk food and habits and man's continued disregard for the findings of scientific ornithologists is clearly set forth.

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[1] The Birds of Nippon. By Prince Taka-Tsukasa. Volume I, Part 5. The Bibliography Order Galli. H. F. & G. Witherby, Ltd., 326 High Holborn, London, W. C. I. Yokendo, 7 Motozono-Cho, Kojimachi-Ku, Tokyo. 15th November, 1935. Pp. lx–lxvi, 239–290.

[2] Contribuição à ornithologia de Goyaz. Notas criticas sibre uma collecção de aves feitas no sul do estado. Revista Mus. Paulista, XX, pp. 1–172. 1936.

[3] Proc. Linn. Soc. N. Y., for the year ending March 1935. No. 47. Price 75 cts.

It is properly charged that the Sharp-shinned Hawk is negligible as a danger to game birds. Its bird food consists of small song birds and it is without doubt nature's implement in killing off the weaker or diseased individuals so as to preserve the stock of these birds at a high state of development. As Mr. Quinn says "these little Hawks are not killed because destructiveness to game; they are certainly not killed for food; they are not killed because it requires any special skill to hit them. They are killed just for the "fun" that certain human beings take in killing a beautiful and inoffensive creature which asks nothing of man except to be allowed to live!

In the same connection we may quote W. H. K. whose verse from "Punch" Mr. Quinn has used as an introduction:

"Because a bird or beast is rare
Some sportsman marks it down to kill;
And counting any game as fair
Contrives to make it rarer still.
O *homo sapiens*, who must
At any cost your trigger pull,
I sometimes think *your* species just
A little bit too plentiful!"

While mentioning many details as to Hawk persecution there is an important omission for which it is hard to account i. e. the shameful shooting of Hawks at Cape May Point, N. J. and incidentally the good work of the National Association of Audubon Societies has been doing in policing part of the area and in instructing gunners as to which Hawks may be shot and which may not. The *permission* to shoot Sharp-shins is chargeable to the New Jersey legislature. Mr. Quinn could easily have secured information about Cape May Hawk shooting from Mrs. Edge, of the Emergency Committee, or many others who know about it, and it seems a shame not to have condemned these New Jersey "sportsmen" along with the others. The "Pigeon Hawk" depicted in the illustration is unfortunately and evidently not a Pigeon Hawk.—W. S.

**Ali on 'Economic Ornithology in India.'**[1]—The author comments on the disparity of attention given to systematic and economic ornithology, respectively, in India, and suggests the importance of federal investigation of bird economics. Reference is made to work in the United States and approval is expressed of the volumetric method of stomach analysis. The harmful and beneficial activities of birds are classified and discussed with mention of Indian examples. For instance, 15 per cent of the rice crop in southeastern Khandesh is consumed by Rosy Pastors. On the other hand, thousands of these birds are eaten by the people. The spread of *Lantana* by birds, the symbiotic relationships of Sunbirds and Flowerpeckers with mistletoe, and the fertilization of various flowers by birds are examples of bird-plant relationships discussed. The production of fertile seeds by the silk cotton tree, the species most used for match manufacture in India, is said to depend mainly on cross-fertilization by birds. The direct economic value of birds also is stressed; waterfowl netting in some localities provides almost free sustenance for the local population for several months in the year; egret "farming" is mentioned. Such uses of birds have their dangerous aspects and it is surprising that they have not already become evident in a country with so dense a population as India. An interesting review, bringing to attention novelties to students of economic ornithology in other lands.—W. L. M.

[1] Current Science, 4(7), Jan. 1936, pp. 472–478.

## Other Ornithological Publications.

**Bullock, Dillman S.**—Las Aves de la Isla de la Mocha. (Revista Chilena de Hist. Nat., 1935, pp. 232–253.)—A list of 92 species with many photographs of nests and eggs.

**Carriker, M. A.**—Lice of the Tinamous. (Proc. Acad. Nat. Sciences, Phila., 1936, pp. 45–218.)—Those interested in the parasites of birds and entomologists interested in the Mallophaga will find important matter in this paper which contains descriptions of one new family, three new subfamilies, sixteen new genera, forty-six new species and thirteen new subspecies of bird lice. There are keys and descriptions of all known forms and 32 plates. The Tinamous seem to possess more species and genera of lice both as a group and as individuals than any other family of birds.

**Chapin, James P.**—Through Southern Polynesia. (Natural History, April, 1936.)—Numerous excellent photographs of birds and incidental mention of them in his account of the voyage, which included visits to Pitcairn and Easter Islands.

**Chapin, James P.**—Islands West of South America. (Natural History, June, 1936.)—A continuation of his experience on the voyage of the 'Zaca' in the South Pacific.

**Darling, Jay N.**—The Wildlife Crisis. (American Forests, March, 1936.)—Other articles by Aldo Leopold and Ira N. Gabrielson as well as an editorial discuss the same subject.

**Fox, Arian C.**—Planting Guide for Game Bird Cover and Food in the Dakotas.—A mimeographed list with helpful suggestions admirably prepared.

**Harris, Harry.**—A Sketch of the work of Allan Brooks with reproductions of a number of his paintings, prepared in connection with an exhibition at the annual meeting of the Cooper Ornithological Club at Los Angeles.

**Jourdain, Rev. F. C. R.**—On the Winter Habits of the Green Woodpecker (*Picus viridis virescens*) (Proc. Zool. Soc. London, 1936, pp. 251–256.)—Detailed account of a female bird occupying a nesting box during two winters.

**Munro, J. A. and W. A. Clemens.**—Food of the American Merganser in British Columbia. (Canadian Field Naturalist, March, 1936.)

**Pinto, Oliverio.**—Os Mutuns do Brasil. (Boletim Biologico, II, No. 3, 1935.)—A discussion of the species of Curassows with a key for determination.

**Pinto, Oliverio.**—Notas de Ornithologia Amazonica. (Revista Mus. Paulista da Univ. S. Paulo XX, pp. 229–244, 1936.)—Comments on various species with description of *Picumnus pusillus* (p. 234) sp. nov., from Codajaz on the Rio Solimoes.

**Riley, J. H.**—A New Babbler from Southeastern Siam. (Proc. Biol. Soc. Wash., vol. 49, pp. 25–26, March 9, 1936.)—*Alcippe nipalensis eremita* (p. 25) Kao Seming, Krat.

**Sawyer, Edmund J.**—Springtime with Nature. (Nature Magazine, April, 1936.)—Describing birds of the Yellowstone National Park, with illustrations by the author.

**Schouteden, Dr. H.**—Cintribution a la Faune ornithologique du Nord-est du Congo Belge. (Ann. du Musée du Congo Belge. Zool. Ser. IV, Tom. 1. Fasc. 2, pp. 41–156. April, 1936.)—A compiled list of the birds of the Belgian Congo with distribution, synonymy, type localities, etc. covering 665 species and numerous additional subspecies. There is also a map showing the routes of the expeditions of Emin Pascha, Boyd Alexander, Lang and Chapin and Schouteden.

**Shaver, Jesse M.**—A Midwinter Bird Census in Tennessee. (Jour. Tenn. Acad. Sci. XI, No. 2.)—Forty species on January 5, 1936.

**Sumner, E. Lowell, Jr.**—A Life History Study of the California Quail with

Recommendations for its Conservation and Management. (California Fish and Game, Vol. 21. No. 3–4, 1936. Price 25 cts.)—An admirable report on this important game bird, setting forth the life history, in great detail, its habitat and the plants that should be maintained as food. Enemies of the Quail are also considered. Predatory birds are found to be useful in keeping rodents in control and only Cooper's and Sharp-shinned Hawks are found to catch Quail and even in the case of these species the value they do in controlling seed-eating Sparrows which threaten the food supply of the Quail balances any destruction to the latter birds. So is the conservation problem complicated far beyond the knowledge or intelligence of the average Legislature which frames our game laws! Mr. Sumner has done an excellent service in preparing this report which should be a guide and help to all interested in this beautiful game bird.

**van Rossem, A. J.**—Description of a Race of *Myiarchus cinerescens* from El Salvador. (Trans. San Diego Soc. Nat. Hist., VIII, No. 16, March 12, 1936.)—*M. c. flavidior* (p. 116) Lake Olomega.

**van Someren, Vernon D.**—Territory and Distributional Variation in Woodland Birds. (Scottish Naturalist, March–April, 1936.)—A wood in Midlothian with fifteen resident species and ten migrants or casuals was the scene of the study.

**Waterson, George.**—Bird Notes from Fair Isle. (Scottish Naturalist, May–June, 1936.)

**Williamson, W. Adrian.**—Mangroves and Mystery. (American Forests, February, 1936.)—Bird Life in the Everglades National Park, with excellent photographs.

### The Ornithological Journals.

**Bird-Lore.** XXXVIII, No. 2. March–April, 1936.

In the Hauts of the Heron. By Herbert Ravenel Sass.—A delightful sketch of bird life on the South Carolina coast with illustrations by Peterson.

Sketch of the late Warren F. Eaton with portrait.

Naturschutz in Germany. By Aldo Leopold.—A most important article especially in its relation to predator control. The Eagle Owl which had been exterminated is actually being replanted in one of the national parks!

The 'Timber-Doodle.' By Alfred M. Bailey.—A word on the Woodcock with two excellent photographs.

Wild Life and Erosion Control. By H. H. Bennett.

The Junior Bird Club. By Kenneth D. Morrison.

There is a leaflet on the Bluebird by Roger T. Peterson.

**Bird-Lore.** XXXVIII, No. 3. May–June, 1936.

Puffin Metropolis. By Harrison F. Lewis.—Perroquet and Greenly Islands, Gulf of St. Lawrence.

Private Secretary to a Sparrow. By A. Marguerite Heydweiller.—Life of the Tree Sparrow.

Bird-Song Study Problems. By Albert R. Brand.

A Plea for the Great Blue. By John Miles Flynn.

There is a leaflet by Roger Peterson on the Ruby-throated Hummingbird.

The usual features: Season, Warden and Sanctuary Reports, Field Notes and Reviews. The notice of Rutledge's 'Wild Life of the South' should be read carefully by those who would know what they are purchasing when they buy popular nature books!

**The Condor.** XXXVIII, No. 2. March–April, 1936.

Habits and Nest Life of the Desert Horned Lark. By A. Dawes DuBois.

Three Broods of Red-backed Juncos in One Season. By L. J. Hargrave.—Determined by banding.

Nesting of the Bonaparte Gull in British Columbia. By J. A. Munro.

Viability of Weed Seeds after Ingestion by California Linnets. By Elizabeth S. Roessler.—Out of 40,025 seeds eaten by the birds only seven germinated, after all had been planted and watered! Full details of the experiments are given.

Taxonomic Comments on Red-tailed Hawks. By P. A. Taverner.—An interesting résumé of the forms of these Hawks in which all those of the A. O. U. 'Check-List' are considered in the key except *B. b. umbrinus*, on the status of which the author is silent, while two more *B. b. alascensis* and *B. b. fuertesi* are recognized. The author states that his discussion deals with "present fact" not with "origin" and yet he attributes many of the specimens to "hybridism" while *kriderii* is referred to as a species in one place and a white phase of *borealis* in another. In his final systematic conclusion four races of *borealis* are recognized while *harlani* stands as a full species. If we understand Mr. Taverner correctly these five forms have been differentiated in the past (*harlani* further than the others) and now are interbreeding and breaking down the subspecific and specific boundaries, but why not simplify the matter by regarding the forms as still in the making and the perplexing specimens as intermediates not "hybrids"?

Eating Habits of Falcons with Especial Reference to Pellet Analysis. By Richard M. Bond.—"Falcons are prone to form [individual] prey habits and to confine food taken to a single species or group as exclusively and as long as may be!"

Status of the Cormorants of Great Salt Lake. By William H. Behle.

Up Hill Planters. By Joseph Grinnell.—California Jays carrying acorns up hill for storage.

Summer Notes from Plumas County, California. By Joseph Ewan.

**The Condor.** XXXVIII, No. 3. May–June, 1936.

A Tree Nesting Quail. By Harry L. and Ruth Crockett.

Age Determination in the American Crow. By J. T. Emlen, Jr.—In distinguishing first winter birds from adults the square instead of rounded end to the tail feathers is the best character although the flight feathers of the younger bird are more worn, less heavily pigmented and whiter below than in the adults, while the tail is more square-cut at the end and the wing usually somewhat shorter.

Abnormalities in Birds. By Harold and Josephine R. Michener.

Food of the Common Mallard in the Lower Fraser Valley, B. C. By J. A. Munro.

Coloration of Downy Young Birds and of Nest Linings. By Jean M. Linsdale.

The Orange-bellied Redstart of Western Central America. By A. J. van Rossem.—*Myioborus miniatus hellmayri* (p. 117) n. sub. sp. from El Salvador.

**The Wilson Bulletin.** XLVIII, No. 1. March, 1936.

Blue Heron Colonies in Northern Ohio. By E. L. Moseley.

Food of the Limpkin. By Clarence Cottam.—Almost entirely gastropods.

Egg Laying by the Cowbird During Migration. By Thomas D. Burleigh.—Interesting evidence.

Episodes in the Life of Audubon in Indiana. By S. E. Perkins, III.

Sketch with portrait of Percival B. Coffin. By R. M. Strong and W. C. Allee.

Observations on the Florida Blue Jay. By Donald J. Nicholson.

Nesting of the Prairie Falcon in Montana. By V. L. Marsh.

Concentration of Catbirds at the Close of the Nesting Season. By Geoffrey Gill.

The Bird Collection of the Carnegie Museum. By Ruth Trimble.

**Bird-Banding.** VII, No. 2. April, 1936.

Sex, Age and Individual Variation of Winter Tree Sparrows. By A. Marguerite

Heydweiller.—No one external character is entirely reliable but measurements of wing and tail are the best. In grouping 129 specimens as male ad., male im., female ad., female im., dissection later showed that all determinations of adult males and immature females were correct, largest size and purer crown patch indicating the former and smallest size and mottled crown patch the latter. In the other two groups there was an error of 9.30%.

Banding Studies of Semi-domesticated Mallard Ducks. By P. L. Errington and W. E. Albert, Jr.—Observation of a large flock of liberated artificially-raised Mallards confirmed Lincoln's statement that while 20 to 25% of banded wild Ducks have been recovered only 1½% of captive-bred birds have been again heard from.

The Wing Molt in Purple Finches. By M. J. Magee.

Notes on the Plumage of the Eastern Red-wing. By Fred M. Packard.

**The Oölogist.** LIII, No. 3. March, 1936.

The Land Birds of Rockbridge Co., Virginia. By J. J. Murray.—A well annotated list.

**The Murrelet.** XVII, No. 1. January, 1936.

Some field notes on western birds.

**Bulletin of the Essex Co. [Mass.] Ornithological Club.** No. 17, December, 1935.

Notes on New England Hairy Woodpeckers. By Ludlow Griscom.—Discusses the characters of *Dryobates v. villosus* and *D. v. septentrionalis*.

Five Year Christmas Census Comparison. Cape Cod versus Cape Ann. By Seth H. Low.

About the Glossy Ibis—and Sight Records. By S. G. Emilio.

Annotated List of Birds Observed in 1935. By S. G. Emilio.

Many other local notes including birds of the annual Ipswich River trip.

**Iowa Bird Life.** VI, No. 1. March, 1936.

The Present Status of the Prairie Chicken in Iowa. By William Youngworth.

Numerous Local Notes.

**The Nebraska Bird Review.** IV, No. 2. April, 1936.

A Study of the Distribution, Migration and Hybridism of the Rose-breasted and Black-headed Grosbeaks in the Mississippi Valley. By M. H. Swenk.

Local Notes.

**The Migrant.** VII, No. 1. March, 1936.

Something about Birds, Nests and Eggs. By H. S. Vaughn.

The History of a Martin Box. By Jamie R. Tippens.

Many notes and migrations of Tennessee birds.

**Bulletin of the Massachusetts Audubon Society.** XX, Nos. 1–5. February–June, 1936.—Contains much interesting popular information on birds and bird protection.

**The Gull.** XVIII, Nos. 3 and 4. March and April, 1936.

Notes on the birds of the San Francisco region.

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Mimeographed journals containing much of interest to bird students of the states in which they are published or in the fields of study which they represent are as follows:

**The Raven.** VII, Nos. 2–3 and 4. February–March and April, 1936.

Devoted to bird study in Virginia.

March Birds of the Eastern Shore. By Alexander Wetmore. [April.]

Mark Catesby. By J. J. Murray. [April.]

**The Redstart.** III, Nos. 6, 7 and 8. March, April and May, 1936.
Treats of the birds of West Virginia.
**The Flicker.** VIII, No. 1. February, 1936.
Bird notes from Minnesota.
Natural History Notes from Red Lake. By Gustav Swanson.
**The Prothonotary.** II, No. 3, 4 and 5. March, April and May, 1936.
Published by the Buffalo, N. Y. Ornithological Society.
**The Snowy Egret.** X, No. 2 and XI, No. 1. Winter 1935 and Spring, 1936.
Notes and papers on birds of Kentucky, Michigan and other states.
Spring Observations at McMillan, Mich. By O. M. Bryens. (Winter issue.)
Birds Observed in the Upper Peninsula of Michigan. By L. H. Walkinshaw. (Spring.)
**The Night Heron.** V, No. 1. Spring, 1936.
Missouri bird notes.
**News from the Bird-Banders.** X, No. 3 and XI, Nos. 1 and 2. August, 1935 and February and May, 1936.
Bird banding activities of the Western Bird-Banding Association, Berkeley, Calif.
**Inland Bird Banding News.** VII, Nos. 3 and 4, VIII, No. 1. September and November, 1935 and March, 1936.
Activities of the Inland Bird-Banding Association, Chicago, Ill.
**Saint Louis Bird Club Bulletin.** V, No. 3. March–April, 1936.
**News Letter Audubon Society of Missouri.** III, Nos. 4 and 5. April and May, 1936.
**Long Island Bird Notes.** III, Nos. 11–21. March–May, 1936.
Conducted by David E. Harrower, Woodmere, N. Y.

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**The Ibis.** (13, series.) VI, No. 2. April, 1936.
Field-notes on the Birds of Zanzibar and Pemba. By R. H. W. Pakenham.—Based on observations during a residence from 1929 to 1934.
On the Indian Ashy Drongos. By C. B. Ticehurst.—Two species are recognized—*Dicrurus longicaudatus* with two races, and *D. leucophaeus* with three.
On the Birds of East Finmark. By H. M. S. Blair.
A Note on the Black Fiji Petrel. By G. M. Mathews.—A new genus *Pseudobulweria* (p. 309) proposed for *Thalassidroma macgillivrayi* Gray.
The Finches of the Galapagos in Relation to Darwin's Conception of Species. By Percy R. Lowe.—An interesting résumé of the problem of these Galapagos birds which present such a bewildering array of variations. Dr. Lowe hopes that "investigators properly equipped, may be sent to the Galapagos with the object of conducting actual breeding experiments and quotes Lord Rothschild to the effect that "if the collections which have already been made are not sufficient to throw light upon the problem no collections will ever do so."
Birds of Grimsey in North Iceland. By P. F. Holmes and D. B. Keith.
On the Races of *Ammomanes deserti* found in Arabia and near its Borders. By G. L. Bates.
Further Observations from Albania. By Hugh Whistler.
A Nominal List of the Birds of Celebes. By Erwin Stresemann.—220 native resident forms. *Corvus enca celebensis* (p. 368), *Hypotaenidia torquata remigialis* (p. 368) and *Amaurornis phoenicura variabilis* (p. 369) are described as new.
Systematic Notes on East African Birds. Part X. By C. W. Machworth-Praed and C. H. B. Grant.

**Bulletin of the British Ornithologists' Club.** No. CCCXCIII. March 4, 1936.

Miss Ruth Cooper presents notes on birds seen at Fez, Morocco, and Dr. G. Carmichael Low described a trip around the world with lists of the birds seen *en route*. Eastern Ground Doves "in fields on the way to Chicago" from Washington will interest ornithologists of the former city and Chimney Swifts at the Grand Canyon constitute another remarkable record!

Guy Harrison discusses the South American Cowbird, *Molothrus bonariensis* and its fosterers.

C. M. N. White discusses the races of *Petrochelidon nigricans*.

**Bulletin of the British Ornithologists' Club.** No. CCCXCIV. April 2, 1936.

Solomonsen describes *Lagopus lagopus variegatus* (p. 99) from western Norway; and C. W. Benson, *Alethe macclouniei njombe* (p. 100) from southern Tanganyika.

**Bulletin of the British Ornithologists' Club.** No. CCCXV. May 6, 1936.

Admiral Lynes describes *Cisticola dambo kasai* (p. 109) Banda, Belgian Congo, and replaces *Cisticola angusticauda* in the genus *Cisticola* from which it had been removed.

*Stachyris nigriceps rileyi* (p. 115) is proposed by F. N. Chasen for *S. n. dilutus* preoccupied.

**British Birds.** XXIX, No. 10. March, 1936.

An Investigation of the Food of Captive Little Owls. By A. Hibbert-Ware.

Some Notes on an Essex Rookery. By James W. Campbell.

Starlings Fighting for Nesting Sites. By George Marples.

Recovery of Marked Birds.

**British Birds.** XXIX, No. 11. April, 1936.

Young Rooks, Their Survival and Habits. By J. P. Burkitt.

"British Birds" Marking Scheme. By. H. F. Witherby.—Contains a list of the numbers of each species "ringed" from 1909 to 1934 with the number of recoveries. Of the Blue Tit 4432 were ringed and 647 recovered but of Blackbirds 42469 were ringed and only 1491 recovered. The percentage of recoveries for the various species ranges from .01 (Gray Wagtail) to 24.2 (Merlin).

Birds of Inner London. [A Supplement.] By A. H. Macpherson.

**British Birds.** XXIX, No. 12. May, 1936.

Birds Seen on the North Atlantic, August and September, 1935. By K. B. Rooke. —On two crossings from Liverpool to St. Johns, Newfoundland.

Nesting Habits of the Willow Tit. By Tom L. Johnston.

**The Oologists' Record.** XVI, No. 1. March, 1936.

The Work of British Ornithologists Abroad in 1935. By Rev. F. C. R. Jourdain.

Notes on Some Breeding Birds of Southern Uruguay. By B. Guy Harrison.

Notes on nests and eggs of various species.

**The Avicultural Magazine.** (5th series.) I, Nos. 3, 4, and 5. March–May, 1936.

The color plates presented in these three issues are, respectively, the White-throated Lory, Pectoral Finch and Red Lory, the Finch from a painting by Cayley, the Lories by Roland Green.

A West Indian Diary. By S. Porter.—Runs through two issues dealing with the birds of Jamaica.

There is a paper on Rheas by J. Delacour and many notes on aviculture.

**Bird Notes and News.** XVII, No. 1. Spring, 1936.

This publication of the Royal Society for the Protection of Birds contains vigorous protests against the cutting of trees, trimming of hedges and cropping of lawns along

highways, until birds have no place to nest or feed. Much the same thing is going on in America and receives the condemnation of all lovers of wild life.

There are accounts of sanctuaries and of the value of birds to agriculture, etc.

**The Emu.** XXXV, Part 4. April, 1936.

The Topknot Pigeon (*Lopholaimus antarcticus*). By P. A. Gilbert.—With colored plate and photographs.

Plants Spread by the Silver-eye. By G. R. Gannon.

Various Bird Problems. By A. H. Chisholm.—Vocal Mimicry; disappearance of the Paradise Parrot; distribution and relationship of several forms.

Distribution Map of Thornbills. By A. G. Campbell.

On A Hitherto-unrecorded Egg of the Lesser Emu of Kangaroo Island, with Description. By George E. Mason.

The Cat Island Gannet Rookery. By Bruce Anderson.—800–1,000 birds against 300–4,000 originally there.

The Food of Australian Birds. By A. H. Lea and J. T. Gray.—Lists of stomach contents.

Some Random Notes on the Little Grebe. By R. T. Littlejohns.

Photographing the Black-throated Grebe. By M. S. R. Sharland.

And the usual number of short notes on Australian birds and excellent photographs.

**The South Australian Ornithologist.** XIII, Part 5. January, 1936.

Notes on the Albatrosses Occurring in South Australian Waters. By H. T. Condon.—An excellent article with descriptions and measurements of many specimens.

**L'Oiseau.** VI, No. 2. 1936. [In French.]

Rare or Remarkable Birds from the Philippine Islands. By Marquis Hachisuka.

A Comparative Study of the Hummingbirds of the Group *Helianthea*. By J. Berlioz.

A Revision of the Genus *Alcippe* Blyth. By K. Y. Yen.—No new forms described in this installment.

The Consumption of Mollusks by Birds. By Andreé Kleiner.—Mainly by water birds but many other groups including Passerine species are found to eat them.

New Researches on the White Storks of Algeria. By G. Bouet.—Density of nest population.

Cancers in Birds. By R. Salgues.

Variation in Plumage and Form in Birds. By M. Legendre.

Capture of a Pectoral Sandpiper in France. By L. Delapchier.

**Journal für Ornithologie.** 84 Jahrgang, Heft 2. April, 1936. [In German.]

Sketch of the late Michael Menzbier. By Hermann Grote.

Homing Experiments with Starlings and Swallows in 1935. By Werner Rüppell.

Functional Anatomical Researches on the Bird Wing. By Maxheinz Sy.

The Migration Route of the Crane. By Walter Libbert.

**Ornithologische Monatsberichte.** 44 Jahrgang, No. 2. March–April, 1936. [In German.]

The International Stork Census. By E. Schüz.

Preliminary Account of the Results of the Archbold-Rand New Guinea Expedition of 1933. By Ernst Mayr and A. L. Rand.

What is Picus viridis virescens? By Güther Niethammer.

The Terminology of Geographic Variability. By B. Rensch.

**Der Vogelzug.** 7 Jahrgang, No. 2. April, 1936. [In German.]

Stimmelmayr's Guide Lines. By H. Baron Geyr von Schweppenburg.

Twenty-ninth Report of Bird Study at Rossiten. By E. Schüz.

Numerous notes on bird-banding.

**Vogelring.** VIII, Hft. 2. Spring, 1936. [In German.]

A Bird Paradise. By Ulrich Feit.—Photographs of Bittern and nest.

Banded Birds as Victims of Birds of Prey. By Otto Lüders.—A long list of victims.

**Beiträge zur Fortpflanzungsbiologie der Vögel.** XII, Nos. 2 and 3. March and May, 1936.

The Status of the White Stork in Prussia, Memel, etc. Several authors. (March.)

A Contribution to the Biology of German Owls. By Otto Schnurre. (March.)

Sociology of the Herring Gull. By N. Tinbergen. (May.)

Observations on the Nest of the Harrier (*Circus c. cyaneus*). By Hans Hennings. (May.)

Many notes on nesting and eggs of various birds.

**Le Gerfaut.** 1935, Fasc. 3. [In French.]

Many notes and short papers on the birds of Belgium with much of interest to bird banders.

**Der Ornithologische Beobachter.** 33 Jahrgang, Heft. 5, 6, 7. February–April, 1936. [In German and French.]

Numerous field notes and bird banding reports for Switzerland and the 11th and 12th reports of bird study at the Swiss Station at Sempach. By A. Schifferli.

**Archives of Swiss Ornithology.** I, Fasc. 7. February, 1936. [In French and German.]

On Dependence of the Hen Embryo on an Oxygen Environment. By A. Portman and L. Jecklin.

Reflections on the Systematics of *Cinclus cinclus*. By O. Meylan.

Many notes on Swiss birds.

**Organ of the Netherlands Ornithological Club.** VIII, No. 3–4. April, 1936. [In Dutch.]

The Banding of Lapwings (*Vanellus vanellus*) in Netherlands. By M. J. Tekke.

Bird Migration in Netherlands III. By W. H. van Dobben.—By banding.

Results of the Banding of Starlings in Western Europe. By J. P. Bouma and J. C. Koch.

Other notes on bird banding.

**Ornis Fennica.** XIII, No. 1. 1936. [Mainly in Finnish.]

Some Diving Notes on Young Tufted Ducks, Velvet Scoters and Eiders. By Perka Grenquist. [In English.]

Notes on birds of Finland.

**Ceskloveńsky.** 1936, No. 2. [In Hungarian.]

Notes on birds and ornithologists of Czechoslovakia.

## CORRESPONDENCE.

### Injury Feigning by Birds.

Editor of 'The Auk':

Re the discussion in your correspondence columns of the origin and meaning of the injury-simulating habits of certain nesting birds. We have all noticed this many times. It is so like a decoy method of consciously leading an enemy from the nest that it is difficult to adopt a more mechanistic theory. An experience of some years ago may have a bearing on the subject.

We were in camp at Shoal Lake, Manitoba. A hundred yards or less in front of our tent a Killdeer had its nest on the open prairie without cover, the only concealment being the likeness of its eggs to a few wood chips and the debris in the scanty grass. We had many opportunities of watching this bird and it was interesting to see how it reacted to different potential enemies.

If a horse or cow grazed too near the bird lay low until almost the last minute and then flew suddenly into its face with a great outcry. The animal invariably staggered back at the unexpected onslaught and circled the spot in confusion while the bird, its object accomplished, after a few dives and expostulations returned quietly to its nest. However, when a man or a dog approached, it flew to meet him from afar, indulged in all the broken-winged helplessness with which we are familiar and led the enemy far from the nest before returning to it. These two schemes of action happened too often that summer to be the result of casual accident. The reaction in respect to the dog was particularly interesting. The dog, slavering and all excitement, pursued the bird closely. Every moment we expected to see its jaws close upon its expected prey but each time that prey escaped by a margin so small that hopes of success were raised instead of dampened and the chase was hot. As they drew away from the immediate neighborhood the bird took less and less chances until finally the dog was tearing futily around far from the point of encounter and evidently without thought of returning to it.

I have not been able to verify these proceedings elsewhere or since but in the case of this particular bird the difference with which it treated a harmless blunderer and an active hunter was particularly striking and goes a long way towards suggesting that the feigning is more or less calculated and not the result of a blind mixture of conflicting fears.

P. A. Taverner.

National Museum of Canada.

Editor of 'The Auk':

In the July 1935 issue of 'The Auk' there appeared a letter under "Correspondence" on "Injury-feigning" among various species of birds. H. S. Swarth stated therein that he did not recall ever having seen a passerine bird resort to injury-feigning. With the exception of the Ovenbird my experience tallies with his. In the course of correspondence with Swarth on the subject it was suggested that I submit my own experience with injury-feigning by Ovenbirds.

Concerning this species I may say that I have never known it to flush immediately from the nest on my approach. Uusally the adult bird would run a short distance, then stumble and flutter its wings as if one leg refused to function properly. This stumbling shifted from one leg to the other giving a rather aimless appearance to the performance. The sequence was always the same; the short run from the nest, the

stumbling and wing-fluttering, and finally the escape of the bird by flying. One peculiarity noticed was that the bird did not wait to see if I was following, but rather went through the act in set fashion regardless of whether I ran after her or remained by the nest, except that she would fly sooner if I pursued her closely. In no case did the display last more than a few seconds, the time required for the adult bird to cover about two or three rods of ground.

It appeared as if the entire act took place almost automatically, so machine-like were the movements of the mother. I have seen this display made by other individuals, but it has always been the same stereotyped performance. Perhaps it may be said that such a display is not real injury-feigning at all because of its more or less fixed sequence, but the fact remains that I have flushed many Ovenbirds at other times in the year and I have never seen one do more than run a short distance before flying. There was no attempt at self display.

FRANKLIN H. MAY.

114 Maple Avenue,
Takoma Park, Md.

Editor of 'The Auk':

Francis H. Allen's letter of August 15, 1935, published in 'The Auk' (Vol. LIII, p. 125) comments on a statement by Dr. Herbert Friedmann, in his paper "The Instinctive Emotions of Birds," that he (Friedmann) had never seen any Grouse or Quail practicing "injury feigning."

Observations as a boy on a farm of central North Dakota would lead me to believe that injury feigning is practiced by the Prairie Chicken or Pinnated Grouse, *Tympanuchus americanus americanus*. In my observations, the female bird when molested would leave her nest in the prairie grass and flutter away for a distance, as though a wing were broken, before taking off.

ADRIAN C. FOX.

Park River,
North Dakota.

Editor of 'The Auk':

Some twenty-five years ago I found the nest of a Yellow Warbler (*Dendroica aestiva*) in a bush about four feet from the ground. The sitting bird when flushed from the nest fluttered away, still in the branches, with the "broken wing" action. Though I have found a good many nests since none of the birds acted in this way.

LAURENCE B. POTTER.

Gower Ranch, Eastend,
Saskatchewan.

## Portenko on Limosa lapponica.

Editor of 'The Auk':

The last number of "The Auk" (Vol. LIII, No. 2, p. 194–197) contains a paper by L. Portenko (= Portenko) on the geographical races of the Bar-tailed Godwit, which is likely to provoke serious criticism. The author divides into two races the well known Siberian Godwit (*Limosa lapponica baueri* Naumann) which was originally described from an Australian winter specimen. This type specimen of *baueri* had not been examined by Portenko, nor are the reasons given why the name *baueri* is employed for the bird which occurs only in a small region of easternmost Siberia

(Chukchi Peninsula, etc.) and the islands of Bering Sea, and not rather for the more common bird which occurs across all of northeastern Siberia from the Lena River to the western Anadyr Region. This latter bird is described as new (*menzbieri*), but no effort is made to investigate whether some other name is not already available for this form. In addition to *baueri* Naumann, the names *novae-zealandiae* Gray (New Zealand), *uropygialis* Gould (Australia) and *foxii* (Samoa) have been given to winter visitors. It is practically certain that at least one of these names refers to the common Siberian bird, named *menzbieri* by Portenko.

Portenko may have pointed out the differences between the two Siberian races of the Black-tailed Godwit, but he has by no means settled the nomenclature; rather he has complicated matters by creating another name.

ERNST MAYR.

Amer. Mus. Nat. History, New York.

## OBITUARIES.

Dr. William Harry Bergtold, a Fellow of the American Ornithologists' Union died at his home in Denver, Colorado, March 19, 1936, aged seventy years. He was born in Buffalo, N. Y., on October 28, 1865, and was very active in ornithological study in that state before moving to Denver. There he continued his studies in spite of the constant pressure of his medical career and published a number of important papers as well as his notable volume on 'The Incubation Periods of Birds.' Dr. Bergtold attended the Philadelphia Meeting of the A. O. U. in 1916, and he will be remembered by those who were present on that occasion. Unfortunately the duties of his profession prevented his attending other meetings much to his regret but he kept in touch with many ornithologists by correspondence and few possessed a deeper love for birds and their study. The President of the Union will appoint a biographer to prepare a memorial to be read at the Pittsburgh meeting.

William Louis Abbott, M.D., a Corresponding Fellow of the Union, died at his home near Northeast, Md., on April 2, 1936. He was born in Philadelphia on February 23, 1860, the son of Redman and Susan F. Abbott, and was educated at the University of Pennsylvania receiving the degree of A.B. in 1881 and M.D. in 1884. He continued his medical studies in London, England, working at Guy's Hospital and became a Licentiate of both the Royal College of Physicians and the Royal College of Surgeons (L.R.C.P. and L.R.C.S.).

Being financially independent Dr. Abbott decided to engage in scientific exploration and field work rather than devote his life to the medical profession. He had already, during his college vacations, made collections of birds in Iowa and North Dakota (1880) as well as in Cuba and San Domingo (1883), being accompanied on the first expedition by Joseph Krider, son of the famous Philadelphia taxidermist. Dr. Abbott had also made a valuable collection of the birds of the vicinity of Philadelphia and of southern New Jersey and all of this early material he presented to the Academy of Natural Sciences of Philadelphia where it became the basis of the great study collection since developed at that institution.

In December, 1887, he landed in East Africa where he spent two years exploring the Kilimanjaro region and making extensive collections of birds and large game animals. On his return in January, 1890, these were presented to the United States National Museum where all of his later collections have been given. He visited the Seychelle Archipelago and Madagascar in 1890, 1892, and again in 1894, but from 1891 to 1895 shifted his field of exploration largely to the Himalayas visiting Cashmere, Turkestan and Ladak, and obtaining invaluable material from regions hitherto unexplored by naturalists. In 1897 he explored Siam and for the next ten years visited Sumatra and Borneo and in his own vessel, manned by Malay sailors, cruised the coasts of Siam and the China Sea visiting many small islands the fauna of which had never before been studied. In these later explorations he devoted his attention mainly to small mammals a field which had been much neglected and offered interesting possibilities. His industry and intelligence in collecting brought together in Washington one of the finest series of birds and mammals from the regions that he covered that is to be found anywhere in the World.

Dr. Abbott was also interested in ethnology and gathered material illustrating

the habits and culture of the peoples of the remote countries that he visited all of which is likewise to be found in the National Museum.

Dr. Abbott offered his services as a surgeon to several of the allied countries during the World War but his age and physical condition prevented their acceptance and he returned to America spending the greater part of the years 1916 to 1923 in the exploration of San Domingo and Haiti, penetrating to the interior of the island and securing several birds hitherto quite unknown and unsuspected. Finally retiring from the field work which had so occupied his life, he purchased a farm in the wilder part of Elk Neck on the Elk River in Maryland where he was sufficiently removed from city life to satisfy his love of wild nature and here he spent his remaining years.

After his own field work was over he financed expeditions by others in the interests of the U. S. National Museum and in his will made provision for future work of similar character.

Dr. Abbott was one of the greatest field naturalists that America has produced and his services to natural history and geography cannot be overestimated. No single explorer, so far as we know, has ever brought together such valuable collections and observations from such a wide range of territory. He discovered a large number of new species both of birds and mammals not a few of which have been named in his honor and incidentally, with the interest of a true naturalist, secured material in several other fields as well.

His modesty and aversion to indoor work caused him to refrain from publishing any of the results of his explorations although his wealth of knowledge abundantly fitted him for such an undertaking. He took a deep interest in the Zoological Garden in Philadelphia and was for years a member of the Board of Directors of the Zoological Society as well as of the Council of the Academy of Natural Sciences of Philadelphia. He was in England at the time of the organization of the A. O. U. and did not become a member but in 1916 was elected a Corresponding Fellow in consideration of his services to ornithology. Dr. Abbott never married and is survived by a sister Miss Gertrude Abbott of Philadelphia.—W. S.

John David Digues La Touche, a Corresponding Fellow of the American Ornithologists' Union since 1921, died May 6, 1935, in his 74th year, at sea, while returning home from the island of Majorca, Spain, where he had spent the winter. He was born at Tours, France, June 5, 1861 and received his education at Downside Abbey near Bath, England. He entered the Imperial Maritime Customs Service in China at the age of 21 and remained there nearly 40 years until his retirement in 1921.

Although since his election to the Union he lived in Ireland, either in Dublin or County Wicklow, his name is usually associated with China where he spent the greater part of his life and where he did most of his field work. His contributions to the ornithology of China were numerous and important, beginning with a paper in 'The Ibis' in 1887 and culminating in his 'Handbook of the Birds of Eastern China,' 1925–30, written after his return from the Orient. This manual covers the eight provinces of Chihli, Shantung, Kiangsu, Anhuei, Kiangsi, Chekiang, Fohkien and Kwangtung (see reviews in 'The Auk,' 1925, pp. 595–96 and subsequent volumes), and includes about half of the birds of China representing species of two Zoological regions—those of the Palaearctic, north of the Yangtse Valley and those of the Oriental, south of that valley.

La Touche's more important earlier papers appeared mostly in 'The Ibis' and naturally fall into two groups, those published before and after the war. In the first group should be mentioned his accounts of the birds of Foochow and Swatow

(1892), Fohkien (1905), Chinkeang (1906), and with Ogilvie-Grant, a report on the Goodfellow collection from Formosa (1907). Among the more recent ones are his 'Birds of N. E. Chihli' (1920), Hupeh (1922) and S. E. Yunnan (1923–24). He also published important observations on the migration of birds at Shaweishan Island off the mouth of the Yangtse Kiang (Bull. Brit. Orn. Club, XXIX, pp. 124–160) and at Chinwangtao, northeast of Tientsin (Ibis, 1914, pp. 560–586).

Among the important results of his field work was the rediscovery in Fohkien of *Juneo siemsseni* previously known only from the type specimen. This species was subsequently made the type of a new genus by Bangs and named in his honor *Latoucheornis* (Proc. N. E. Zool. Club, XII, p. 91, 1931).

After La Touche completed his 'Handbook' he disposed of his unrivalled series of Chinese birds which were acquired by the Museum of Comparative Zoology at Cambridge and now form an important part of that great study collection.—T. S. P.

Charles Edward Howard Aiken, a Life Associate of the A. O. U., who may well be termed Colorado's pioneer ornithologist died at Colorado Springs, Colo., on January 15, 1936, in his 87th year. He was born in Benson, Vermont, on September 7, 1850, the son of James E. and Ann (Howard) Aiken and in his early youth the family moved to Chicago where his father's business was wiped out by the great Chicago fire and they moved again, purchasing a ranch on Turkey Creek some eighteen miles west of Colorado Springs and settled there on October 25, 1871. Young Aiken had been collecting birds while in Chicago and probably learned the rudiments of skinning and mounting specimens from a taxidermist to whom he had sold Warblers that he had shot. As early as 1874 he opened a taxidermist shop at his home where he mounted big game heads and various other specimens, and maintained this shop even when engaged in other enterprises. For some time he had a piano and sewing machine business in Colorado Springs but throughout his life his main interest was ornithology and during his first winter in Colorado he travelled over a large area collecting skins of the many birds that were new to him while in 1876 he spent nearly a year in New Mexico and Arizona, driving a two horse wagon through the country then inhabited by the Apache Indians. All through his life he continued to collect and when in 1907 William L. Sclater, who had come to Colorado Springs to take charge of the Colorado College Museum, purchased Aiken's entire collection for the Museum he promptly began to form another.

As one of the few men in the West in those early days who were interested in birds, Aiken was known by correspondence to many of the leading ornithologists of the East. H. W. Henshaw visited him in 1873, and William Brewster, J. A. Allen and Eliott Coues called on him at his home in the years that followed, while Frank Stephens travelling to California with his wife by wagon, stopped at Aiken's home in 1874.

Aiken was a good taxidermist and not only knew how a bird should look but was able to make it look that way, while his skins were in demand among his many correspondents.

He was genial and courteous and beside his interest in birds derived pleasure from his flower garden and in breeding pointer dogs for which he won many prizes.

He published but little although he was an entertaining writer with fine powers of description. In 1873 he published "A Glimpse at Colorado and Its Birds" (American Naturalist, January, 1873) while in the same year appeared his description of *Centronyx ochrocephalus* which later proved to be Baird's Sparrow. Records of birds from Colorado appeared in 'The Auk' in 1900, 1927, 1928 and 1930,

and he collaborated with the writer in "The Birds of El Paso County" which appeared in the Colorado College Publications, Vol. 12, 1914.

Two of the birds that Aiken discovered have been named for him: *Junco aikeni* Ridgway and *Otus asio aikeni* Brewster.

I am indebted to Aiken's sisters Miss Jessie M. Aiken and Mrs. Fanny Aiken Tucker for notes and information which they kindly furnished me.—EDWARD R WARREN.

ALBERT PITTS MORSE, an Associate of the American Ornithologists' Union for some years, died at Wellesley, Mass., April 29, 1936, at the age of 73. He was the son of Leonard Townsend and Addie K. Morse and a direct descendant of Samuel Morse of England who originally settled in Dedham, Mass. He was born at Sherborn, Mass., February 10, 1863, attended the local schools and graduated from the Sawin Academy in 1879.

At an early age young Morse began to collect specimens of natural history, learned taxidermy and became acquainted as far as possible with the wild life about his home. At the age of 23 he abandoned farming and took up draughting. Later he became an assistant in the Zoological Department of Wellesley College and in various capacities maintained his connection with the institution for 45 years. During this time he attended the summer school of the Marine Biological Laboratory at Woods Hole, took the summer course in entomology conducted by Prof. J. H. Comstock at Cornell University, and studied vertebrate zoology at Harvard College.

Morse was an all round naturalist but was primarily an entomologist, specializing in Orthoptera (grasshoppers) and Odonata (dragonflies). In 1897, at the suggestion of Samuel H. Scudder, he made a trip to the Pacific Coast to collect Orthoptera and brought back a large collection containing many new species most of which were described by Scudder. In 1903 and 1905 he was appointed a research assistant in the Carnegie Institution of Washington and awarded a fund for studying the locusts of the Southern States from Virginia to Texas. In 1901, at the request of Prof. Alpheus Hyatt, he reorganized the course of instruction in Zoology of the Teachers School of Science of the Boston Society of Natural History, and from 1909 to 1912 devoted a part of the summer vacations to teaching natural history to the young people of Woodstock, Vt., under the patronage of Miss Elizabeth Billings. With her backing he devoted his spare time for several seasons to the preparation of a monograph of the Orthoptera of New England which was published in 1920 as a 350 page volume of the Proceedings of the Boston Society of Natural History. In 1911 he became associated with the Peabody Museum of Salem, at first in charge of insects and later as curator of natural history.

Morse's publications number more than 70 titles, mostly in entomology, but include three bird lists of Dover, Wellesley and Eastern Massachusetts. In addition to his Manual of Orthoptera, already mentioned, he prepared a report on the Orthoptera of Maine for the Experiment Station of that State, reports on his field work for the Carnegie Institution and several short notices of exhibits or activities of the Peabody Museum.

Mr. Morse was an Associate of the A. O. U. from 1922 to 1925 and was re-elected in 1930. He took an active part in entertaining the Union when it held its meeting at the Museum in Salem in 1930. He was a member of a number of other organizations including the Audubon Society of Massachusetts, Essex County Ornithological Club, Northeastern Bird Banding Association, Nuttall Ornithological Club, American Association for the Advancement of Science, Boston Society of Natural History,

Morse Science Club, and several botanical and entomological societies. These affiliations show the wide range of his scientific interests. Above all he was interested in the various phases of the world out of doors, had a large fund of general information on natural history, and was an able and inspiring teacher.

For the facts on which this notice is based, I am indebted to his associate, Mr. S. G. Emilio.—T. S. P.

Mrs. Etta S. Wilson.—Perhaps one of the most surprising features of ornithology is that it attracts persons in so many different walks of life with Mrs. Etta S. Wilson, an Associate member of the American Ornithologists' Union, for more than 18 years was an excellent example of this. She was born in Northport, Leelanau County, Michigan, on July 16, 1857, and died in Detroit, Michigan, on January 5, 1936. Her mother was Mary Jane Smith, eldest daughter of the pioneer missionary, Reverend George N. Smith, and her father was Payson Wolfe, son of an Ottawa Indian chief. Mrs. Wilson was originally christened Esther Eliza Wolfe, but from the fact that she lived with her grandfather Smith, although not regularly adopted, she became known as Etta Smith, which name from long usage became her legal signature. Under this name she was married on January 21, 1881, to Wesley T. Wilson, a descendent of one of the signers of the Declaration of Independence.

Mrs. Wilson began her career as a reporter on the Grand Rapids Herald. She was for many years connected with Detroit newspapers and wrote many stories and feature articles for these newspapers and also for magazines. She was also in demand as a lecturer. The breadth of her interest is shown by the number of societies to which she belonged. She resided for much of her life in Detroit, Michigan, and Indianapolis, Indiana.

Early in life she became interested in birds, and she took up the serious study of ornithology after recovering from a severe illness in 1906. In 1913 she became the Indiana lecturer for the National Association of Audubon Societies, which position she held for a number of years; and also in 1913 began the reports of her observations on the migratory movements of birds for the Biological Survey. Since that time she has been one of the most valuable cooperators of the Biological Survey in this capacity. She was an excellent observer, accurate and painstaking, and sent in some of the best reports that the Biological Survey has received. She was the first to report the return of the Whistling Swan to the Detroit region a number of years ago. She was also one of the best waterfowl observers that the Biological Survey had in the Great Lakes region.

Her publications are not numerous and consist chiefly of short notes and articles, the most outstanding of which is the one entitled "Personal Recollections of the Passenger Pigeon," which appeared in 'The Auk' for April, 1934. In Mrs. Wilson the American Ornithologists' Union has lost a careful student, and the birds of North America a devoted friend. A partial list of her writings is added as of interest in this connection.

Bachman's Warbler and Solitary Sandpiper in Indiana. The Auk, XXXV, No. 2, April 5, 1918, pp. 228–229.

Late Nesting of the Red-eyed Vireo in Detroit, Michigan. The Auk, XXXVI, No. 1, Jan. 5, 1919, pp. 115–116.

Snowy Owl in Detroit, Michigan. The Auk, XXXVI, No. 4, October 31, 1919, p. 569.

Strange Conduct of a Robin. The Auk, XXXVI, No. 4, October 31, 1919, pp. 584–585.

Hooded Warbler (*Wilsonia citrina*) on Belle Isle, Detroit, Michigan. The Auk, XXXVIII, No. 2, April 15, 1921, p. 281.

King Eider (*Somateria spectabilis*) in Michigan Waters. The Auk, XXXVIII, No. 3, October 5, 1921, pp. 454–455.

An Enormous Flock of Canvasbacks (*Marila valisineria*) Visit the Detroit River. The Auk, XXXIX, No. 2, April 17, 1922, pp. 250–251.

Black Vulture (*Coragyps urubu*) in Michigan. The Auk, XLII, No. 3, July 6, 1925, pp. 442–443.

Bird Lore's Twenty-Sixth Christmas Census, Detroit, Michigan. Bird Lore, XXVIII, No. 1, February 1, 1926, p. 38.

Bird Lore's Twenty-Ninth Christmas Census, Detroit, Michigan. Bird Lore, XXXI, No. 1, February 1, 1929, p. 46.—HARRY C. OBERHOLSER.

Interesting Case of Albinism. The Auk, XLVII, No. 2, April 17, 1930, p. 419.

Tameness of the Saw-Whet Owl (*Cryptoglaux acadica*). The Auk, XLVIII, No. 2, April 10, 1931, pp. 266–267.

Personal Recollections of the Passenger Pigeon. The Auk, LI, No. 2, April 4, 1934, pp. 157–168.

Additional Notes on the Passenger Pigeon. The Auk, LII, No. 4, October 11, 1935, pp. 412–413.

MRS. FREDERICK THOMPSON BICKNELL (Mrs. Carrie Elizabeth Fargo Bicknell), an Associate of the American Ornithologists' Union, died at the age of 79, in Los Angeles, Calif., June 17, 1934, after an illness of two years. She was the daughter of Lorenzo D. and Sarah Rich Fargo and was born at Lake Mills, Wis., May 17, 1855. From the time of her marriage to Dr. F. T. Bicknell, Dec. 6, 1882, she made her home in Los Angeles, where, in later years, she took an active part in the work of bird protection and nature study. In 1913 Mrs. Bicknell was elected an Associate of the American Ornithologists' Union and a Member of the Cooper Ornithological Club, and during the decade from 1915 to 1924 she served as president of the Los Angeles Audubon Society. She also engaged actively in the work of the State Audubon Society and of the Federated Women's Clubs of California.

She was an occasional contributor to 'Bird Lore' and 'The Condor.' Among her notes in the latter journal were records of the occurrence of the Brown Pelican at Alert Bay, B. C., in July 1913; Sabine's Gull at Anaheim Landing, Calif., in August 1921; the Snowy Egret in Los Angeles County in 1922; and the Golden Plover at Playa del Rey, near Los Angeles, in October 1923.

Always alert, affable and a natural born leader, Mrs. Bicknell exerted a wide influence in her chosen circle and left a notable record of accomplishment in the fields in which she was interested.—T. S. P.

## NOTES AND NEWS.

NOMINATIONS FOR FELLOWS, Corresponding Fellows and Members should be in the hands of the Secretary on or before July 15. In accordance with the By-Laws, each nomination for a Fellow or a Member should be endorsed by three proposers.

THE LOCAL COMMITTEE ON ARRANGEMENTS has selected October 19–22, 1936, as the time of the annual meeting of the A. O. U. in Pittsburgh. It is not too soon to begin making plans to attend and it is hoped that all who can do so will endeavor to be present. Particularly is it desirable that there should be a large attendance from Pennsylvania and from places in nearby states and Canada. Recent reductions in railroad rates should materially enlarge the radius of attendance and decrease the traveling expenses of members who reside at a distance.

A LARGE COMMITTEE has been formed in England to erect a memorial to the late Lord Grey, statesman and lover of nature. This is to be three-fold in character:

1. To set up a statue or bust in a central spot in London.
2. To acquire and make over to the National Trust "Ross Castle," the small hill-top crowned by an ancient earthwork which adjoins Chillingham Park in Northumberland, a favorite view-point of Lord Grey's, which he often visited from Fallodon.
3. To develop (by further endowment and otherwise) the existing scheme of research maintained by the British Trust for Ornithology at Oxford, of which University he was an undergraduate and in later years the Chancellor, to form a permanent Institute of Bird Studies, to which his name would be attached.

Subscriptions should be sent to the Hon. Treasurer, The Lord Plender, at Barclays Bank Ltd., 23, Grosvenor Gardens, S.W. 1, London, made payable to "The Viscount Grey Memorial."

The subscription circular goes on to say:

"Lord Grey's love of wild birds, and his genius for expressing the widely-shared delight in watching them, won him the affection of thousands of people in England and oversea. As Chancellor of Oxford University he warmly supported the attempts then being made to create a team of field observers centered on the University.

"It is therefore fitting that his memorial, after provision of the statue or bust, and acquisition of Ross Castle, should be a permanent endowment of bird-watching in the British Isles, under University direction, and styled the Edward Grey Institute of Bird Studies. This would provide a small but suitably staffed Institute situated at Oxford, to furnish help and advice to everyone needing them on matters relating to wild birds and their habits. It will house the only library in the Birtish Empire devoted to books, MSS., photographs and films about living wild birds, and will initiate co-operative inquiries. It will not duplicate the work of any existing body, but will fill a conspicuous gap.

"The British Trust for Ornithology, in collaboration with the University, has already made a good start in this direction. Teams of observers are successfully at work on experimental investigations, and a valuable library has been presented by a number of ornithologists. A generous response to the Viscount Grey Memorial Appeal will endow Great Britain with a model Institute which will have no match in the world as a centre for helping voluntary effort in the study of wild birds. Such a centre will keep alive the memory of Lord Grey by continuing his work of finding out how birds live and of stimulating more understanding of the pleasures and rewards of bird-watching."

In 'The Auk' for April, 1919, p. 321, appeared a note upon the bird collection of Mr. James H. Fleming which then consisted of some 25,000 skins representing 5,377 species and subspecies and 1,925 genera. Since then the collection has increased to the number of 35,000 skins, representing 7,232 species and subspecies and 2,135 genera and constitutes so far as we are aware the most representative private collection in America, if not in the World.

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